

CANADIAN GEOGRAPHICAL JOURNAL

Vol. XLII

No. 1

JANUARY 1951

PRICE 35¢

UNIVERSITY
OF MICHIGAN

FEB 7 1951

PERIODICAL
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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—of Canada, of the British Commonwealth and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that

will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

The Canadian Geographical Journal will be sent to each member of the Society in good standing. Membership in the Society is open to any one interested in geographical matters. The annual fee for membership is four dollars (Canadian currency).

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CANADIAN GEOGRAPHICAL JOURNAL

Published monthly by
THE CANADIAN GEOGRAPHICAL SOCIETY

36 Elgin Street, Ottawa

Editor - GORDON M. DALLYN—Assistant Editor - MALVINA BOLUS

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth and other parts of the world in which Canada has special interest.

The articles in this Journal are indexed in the *Canadian Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

Address all communications regarding change of address, non-delivery of Journal, etc., to the publication office, 1,000 St. Antoine St., Montreal, Canada, giving old and new address. On all new memberships, the expiry date will be printed on wrapper containing starting number. This will constitute a receipt for subscription.

Membership dues of The Canadian Geographical Society, which include prepaid delivery of the Journal, are \$1.00 per year in any country, payable at par in Ottawa.

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Richard Harrington photograph

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PRINTED IN CANADA

Iron Ore Galore

in New Quebec—Labrador

by J. A. RETTY



ONE OF THE most notable events in the history of Canadian mining has been the discovery and development of iron ore in New Quebec and Labrador. Everyone in Canada is dependent on iron because of the numerous uses of its offspring, steel, but how many are familiar with the history of this new Canadian field? How has it been developed? When will it come into production? What will it mean to the national economy?

Background of Mineral Exploration

The beginning of exploration dates back to 1866-1870, when the Reverend Louis Babel, O.M.I., made annual journeys to the area. Father Babel prepared sketches of the routes followed and compiled a map of the region. Considering his imperfect instruments, its accuracy is quite remarkable. Dr.

A. P. Low of the Geological Survey of Canada spent the field season of 1894 making topographical and geological surveys of the region. Low did not find material of ore grade, but he reported on the favourable character of the geology for the occurrence of iron ore. In 1929, the "New Quebec Company" undertook iron ore exploration in the region. This expedition, headed by Drs. W. F. James and J. E. Gill, first discovered outcrops of iron ore close to Ruth Lake, Labrador.

In 1936, Labrador Mining and Exploration Co. was formed to conduct a search for gold and base metals in Newfoundland-Labrador. The project was in charge of the writer who initiated the first systematic and detailed geological work undertaken. In 1938, iron ore was first discovered by the

At top:—Topography along the "main ore zone"

Richard Harrington

writer in New Quebec and an area was obtained under license from the provincial government.

In 1942, Hollinger Consolidated Gold Mines Limited acquired control of the area with The M. A. Hanna Company of Cleveland participating on a minority basis.

In 1949, Iron Ore Company of Canada was formed to bring the iron ore field into production. It consists of a group of United States steel companies, including Armco, National, Republic, Wheeling and Youngstown Sheet and Tube, associated with Hollinger, Hanna, Labrador Mining and Hollinger North Shore.

Geographical Location

The iron ore field lies some 300 miles north of Seven Islands (Sept Iles), Quebec. The south end of the area is located at Latitude $54^{\circ} 30' N.$, Longitude $66^{\circ} 00' W.$ It extends northwest to Latitude $55^{\circ} 25' N.$, Longitude $67^{\circ} 40' W.$ The deposits lie astride the Quebec-Labrador boundary, and form part of two mining concessions, one of 20,000 square miles in Newfoundland territory held by Labrador Mining and Exploration Company Limited, and the other of 3,900 square miles in New Quebec held by Hollinger North Shore Exploration Company Limited. By 1962, the Quebec concession must be reduced to 300 square miles and the Labrador concession to 1,000 square miles.

General Features of the Region

Topographically, the country is one of sharp contrasts. Proceeding north from the Gulf of St. Lawrence, the Laurentian hills rise majestically from the edge of a six-mile fringe of flat, marine terrace, north of Seven Islands. For the first 100 miles, the land surface is rugged. The country has been deeply incised by swift-running streams. Steep canyons with 1,000-foot walls lie along the major water-courses flowing south. An east-west range of hills rises to 3,200 feet about 50 miles north of Seven Islands. These peaks gradually become lower until the height-of-land between the Moisie River and Hamilton River watersheds is reached at a





Terrain at height of land north of the Moisie River.

distance of 150 miles north of Seven Islands at an elevation of 2,056 feet. Beyond and in the vicinity of the height of land the terrain is comparatively flat and ribboned by occasional ridges 600 to 1,000 feet above the level of the surrounding country. Numerous lakes dot the landscape, some large, some small. Within most of the area underlain by the iron-bearing series, the country assumes a characteristic corrugated pattern due to the alternation of northwest-trending ridges and linear lakes, which are the topographic expression of folded and faulted strata.

Large tracts are also underlain by swamps, broken by myriads of small lakes. There are no true muskegs in the area. The soil consists of a mixture of boulders, sand and clay. Red soils resulting from the weathering of iron formation form a striking feature in the iron ore area.

The Labrador concession is drained by the Hamilton and Naskaupi Rivers which flow east into the Atlantic Ocean. The Quebec concession is drained by the Swampy Bay River which flows north into Ungava Bay.

The vegetation is a continuation of the variety found in northwestern Quebec but the high hills are barren of growth except for the ubiquitous caribou moss and sporadic patches of dwarf birch and other subarctic

flora. Going north, the trees gradually become smaller and the species fewer. Hardwood is entirely absent in the northern part of the area. Occasional stands of fair-sized black and white spruce occur in the sheltered valleys. Sufficient timber can be obtained to supply local needs and firewood is adequate for present requirements.

The climate is much less rigorous than one might expect in these northern latitudes. During the winter of 1947, the writer spent



There are fish in these waters.

Richard Harrington

the months of January and February at the interior base. The lowest temperature experienced during that period was -39° F., while at times the thermometer rose above 32° F. Temperatures in the minus 50's were recorded during the past winter, but the climate is generally not severe. Frequent high winds are the greatest source of discomfort. The major differences between this region and northwestern Quebec are the shorter summer season and the occasional heavier snowfall. There should be no climatic difficulty operating open-pit mines within the area for a period of five to six months of the year.

The possibilities for agriculture are nil. There is little favourable soil and the growing season is short—July is the only month in which frost does not occur.

Game is very scarce; a few woodland caribou are occasionally met. Ptarmigan, however, are very plentiful, while geese, ducks and spruce partridge are less abundant. The lakes and streams teem with lake and brook trout. Fur-bearing animals consisting of fox, otter, mink, marten, beaver and weasel are trapped by the Indians. Bears were frequently seen during the past season.

The picture would be incomplete without mention of the black flies and mosquitoes. Undoubtedly this region is the source of supply for the entire universe. The black flies remain from snow to snow while, during the warmer season, they are reinforced by the mosquitoes. However, as in other areas, when the land is cleared and the moss removed their intensity is appreciably diminished.

Some fifty families of Montagnais Indians, from the Seven Islands reserve, spend the winter trapping in the region. There are no permanent settlements other than the bases of the mining company where a small number of men are stationed during the winter months. Three posts of the Hudson's Bay Company, located on Ashuanipi, Petitsikapau and Attikamagen Lakes, were abandoned about 1873, and a Canadian Government weather station on Sandgirt Lake was abandoned in 1948.

Aerial Transportation

As usual, on remote Canadian mining projects, aircraft have played an all-important part in the development of the iron field. The canoe route from Seven Islands up the turbulent Moisie River is slow, difficult and impracticable. Indians familiar with the district require one month to negotiate the first 150 miles. Because of this, the area remained dormant for thirty-five years after publication of Low's report, although a prospector named R. B. Daigle made many trips into the region beginning in 1914 and continuing to 1946. Unfortunately, there is no record of his travels or of his observations.

From the inception of exploration in the iron ore concessions, aircraft have been used continuously both on freighting from tide-water and on inland field work. Owing to the continuing absence of other means of transportation, the operation is still entirely air-borne and will remain so until the completion of the railroad.

Air transportation to the area is now supplied by Hollinger Ungava Transport Ltd., a subsidiary of Hollinger North Shore Exploration Company Limited, which is licensed to carry freight and passengers for all associated companies.



The hood is used as protection from flies by geologist Dr. R. Béland.

Richard Harrington



Small, float-equipped aircraft.

Richard Harrington

The fleet consists of ten aircraft: two C-47's, one Canso, one Lockheed Lodestar and six small float and ski equipped machines. The larger aircraft are used on freighting from tidewater to the inland base while the smaller aircraft service the parties on inland field work. All modern flying aids have been installed, where required, and standard air line procedure is strictly adhered to.

The main airports on tidewater which serve the area are:

(1) *Mont Joli, P.Q.*—(Lat. 48° 37' N.; Long. 68° 12' W.) Situated on the south shore of the Gulf of St. Lawrence, 359 miles from Montreal on the Montreal-Halifax branch of the Canadian National Railways. This is the main air base, and the take-off point for all passengers, mail and express from Montreal.

(2) *Seven Islands, P.Q.*—(Lat. 50° 18' N.; Long. 66° 09' W.) Situated at the heel of the Gulf of St. Lawrence, on the North Shore, the southern terminus of the railroad. Heavy equipment and supplies are delivered here by boat from Montreal and transported inland by air.

The inland landing strips maintained by Hollinger Ungava Transport are:

(1) *Knob Lake*—(Lat. 54° 50' N.; 66° 40' W.) This strip was located by the writer in 1946 and constructed in 1947. It is 4,300 feet long and 300 feet wide and is surfaced by gravel. It is an ideal site for an airport. All materials, equipment and personnel used on the iron ore project are delivered to this point. Knob Lake seaplane base is located some seven miles west.

(2) *Wacouana*—(Lat. 51° 24' N.; Long. 65° 35' W.) This strip was constructed in the fall of 1950. It is located along the route of the railroad and will be used for servicing railroad construction.

As an additional aid to air navigation, an intermediate radio station has been established at Ashuanipi (Lat. 52° 32' N; Long. 66° 15' W.), 160 miles north of Seven Islands. All landing strips are completely radio-equipped and serve as locations for meteorological stations of the Canadian Government.

Airline distances are as follows:

	Miles
Knob Lake to Montreal	716
Mont Joli to Seven Islands	141
“ to Knob Lake	435
Seven Islands to Wacouana	90
“ to Knob Lake	317

From January 1st, 1950, to October 31st, 1950, 1,600 tons of equipment, men and sup-

A Douglas C-47 taking off from Knob Lake landing strip.



Knob Lake seaplane base.

Richard Harrington



plies were delivered to Knob Lake landing strip. In addition, amphibious and float-equipped planes were engaged in supplying the requirements of the railroad, prospecting, drilling and geological crews.

Rocks and Iron Ore

The word "Precambrian" has become synonymous with mineral wealth. Many of the ore deposits of Canada are found in rocks of this era, the oldest of geologic ages. To this lengthy and ever-growing list may now be added New Quebec and Labrador iron ore.

In late Precambrian time, the interior of Labrador was depressed and occupied by a long, narrow arm of the sea. This original depression is known among geologists as the Labrador "trough" or "geosyncline". It extended for at least 400 miles in a northwest direction and was as wide as 60 miles across. In this trough was deposited some 2,000 feet of relatively fresh, unaltered well-bedded sediments containing among other rock types a bed having an original iron content of 30 to 40 per cent. This rock is called "iron formation".

Following this period of deposition, the land again emerged and the strata were subjected to a compressive force from the northeast. Caught in this vise-like grip, the beds were thrown into a series of folds and faults, repeating the iron formation at many places across the trough and throughout its length. As a result, the regional trend is generally northwest and the country has a corrugated appearance due to the alternation of closely-spaced ridges having local elevations up to 1,000 feet.

The majority of the iron ore deposits are found in the vicinity of Lat. 54° 50' N. and

Long. 66° 50' W. either astride or close to the Quebec-Newfoundland boundary. They occupy an area of 50 miles long and 4 to 5 miles across. This is known as the "main ore zone". Twelve miles to the northeast is a parallel group of six ore occurrences, only one of which has been drilled.

Forty miles to the southeast there is one isolated deposit called "Sawyer Lake". The total length of productive zone found to date is 90 miles along a potential length of 225 miles of iron formation occurring within the combined concessions. The ore deposits occur as concentrations (55 to 65 per cent iron) within bands of iron formation.

Type of Ore

The ores vary in colour from blue and red through yellow and brown to black (manganiferous). The colour depends upon the iron minerals present. The brown variety of ore is by far the most common*. The ores are generally soft with a low percentage of "fines".

Iron ores are classified on the basis of phosphorus content into "Bessemer", containing less than .045 per cent phosphorus and "non-Bessemer" when the phosphorus exceeds this amount. Some of the ores have an appreciable content of manganese. When the manganese exceeds two per cent, the material is called "manganiferous iron ore". The most common impurity in New Quebec-Labrador ores is one of the forms of silica. In evaluating drill results, the silica limit is kept at an average of approximately eight per cent.

Ore Estimate

At the end of 1949, the ore estimate was as follows:

1. LABRADOR MINING & EXPLORATION CO. LTD.

Classification	Grade (Dry Analyses)				Tonnage (long tons)
	% Fe	% Mn	% P	% SiO ₂	
Bessemer.....	60.90	0.20	0.029	9.78	63,255,000
Non-Bessemer.....	58.63	0.49	0.113	7.54	41,156,000
Manganiferous.....	49.66	7.55	0.125	8.61	11,491,000
					115,902,000

2. HOLLINGER NORTH SHORE EXPLORATION CO. LTD.

Classification	Grade (Dry Analyses)				Tonnage (long tons)
	% Fe	% Mn	% P	% SiO ₂	
Bessemer.....	60.53	0.35	0.028	8.21	141,735,000
Non-Bessemer.....	57.15	0.58	0.107	8.26	67,722,000
Manganiferous.....	50.11	7.98	0.091	7.68	32,824,000
					242,281,000

TOTAL TONNAGE: 358,183,000

*The following iron minerals are present in the ores: Hematite (Fe₂O₃); limonite or brown ore group (mFe₂O₃·nH₂O)—there are five minerals in this group — and magnetite (Fe₃O₄).



Photographic Survey Co. Ltd.

Eclipse Lake deposit along hillside. Note roads, camp and drill set-up.

In 1950, the tonnage figure attained is in excess of 400,000,000. Final results of analyses are not yet available. Extensive wash tests to remove silica from marginal material were conducted during the past season. These investigations indicate that both the grade and the tonnage of Quebec-Labrador ores can be raised appreciably by using this cheap form of beneficiation.

It will be noted that the term "dry" is used in giving the results of analyses. Iron ores are not marketed on the "dry", but on the "natural" basis. Moisture content (water driven off by heating to 212° F.) must be considered to obtain the true grade. New Quebec-Labrador ores contain approximately seven per cent moisture. This will mean a shipping grade of 55 per cent. In

the 1949 estimate, 12.3 per cent of the ore is manganiferous. This will command a premium in the market.

From the viewpoint of grade, chemical composition and physical character, the ores are of the highest quality. They contain no objectionable impurities and are ideally suited to blast furnace use.

Field Operations

When exploration was undertaken by Labrador Mining in 1936, the only available map of the concession area was that prepared by Low on a scale of 25 miles to one inch, following his one season of field work in 1894. The information was of necessity meagre and confined to general observations along the main watercourses. The labyrinth of lakes, streams and intervening land was not ex-

plored. Between 1894 and 1947, no ground surveys were conducted within the area by government agencies. As a result, not only had the company to finance prospecting operations, but also to spend appreciable sums on topographical and geological surveys, investigations which are usually conducted and paid for by the provincial or the federal government. The objective of this mode of procedure was to select favourable prospecting ground.

Since the inception of work under the present regime, a major part of the operation has been devoted to mapping the rocks and using these maps as a guide in the search for ore deposits. Every type of mapping is done from broad, general reconnaissance to the most exacting of refined detail. During the past season, 95 men were engaged on geological investigations and prospecting. Geological mapping is of vital importance on this project because of the invariable occurrence of iron ore in iron formation.



This rock type must be mapped in great detail. Moreover, the time limit on the concession areas and the shortness of the field season (approximately 100 days) are added stimuli to the rapid conduct of mineral exploration.

In addition to standard geological surveys, aerial photography and geophysical investigations have been used extensively in the search for iron ore; in fact, every known scientific and empirical tool has been used in the conduct of the work.

Base Camp

The choice of the present site at Burnt Creek is the result of evolution. In early exploration, a number of different sites were used. This point was finally selected in 1946 because of its proximity to the ore deposits. Burnt Creek is 10 miles west of Knob Lake landing strip and three miles northwest of Knob Lake seaplane base. This miniature village consists of a cookery, commissary, chemical laboratory, warehouses, staff house, guest house and dispensary. There is a medical doctor in residence. The camp is equipped with electric lights, running water and central heating. A combined machine shop and garage houses the facilities for maintaining mechanical equipment. Temporary camps are erected at the various drill sites to house the personnel. A total of 325 men were employed on mineral exploration during the peak of the 1950 season.

Approximately 150 miles of road have been constructed. This includes all types of road. An improved gravelled highway runs from Knob Lake landing strip to Burnt Creek (10 miles). The remaining mileage consists of secondary roads. The comparative absence of timber and a good supply of gravel greatly facilitate road building.

Whereas in the early days, the only piece of mechanical equipment used was an out-board motor, the operation is now greatly dependent on a variety of machines. Inland,

Surveying.

Richard Harrington



*Looking south across
base camp Burnt Creek.
The crescentic slide at
left background is in
Ruth Lake No. 3 ore
body.*

Photographic Survey
Corporation Ltd.

*Main Street, base camp,
Burnt Creek.*

Richard Harrington



Cook-house at temporary drill camp.

Richard Harrington

Geological field camp.

Richard Harrington





Test drill mounted on half-track, self propelled.

Power shovel at work.

Richard Harrington





Churn drill.

Diamond drill.

Richard Harrington



the chief method of locomotion is by light truck, jeep, jeep truck, station wagon and in the winter by snowmobile. Heavy trucks, dump trucks, bulldozers, farm tractors, dozer shovels, power shovels and a grader are used to transport heavy equipment and to build and maintain roads. Churn drills, diamond drills, rock drills and compressors are among the many items of mining equipment in use.

Digging and Drilling

Although the pick and shovel still have uses on the job in shallow overburden, they have largely been supplanted on large-scale excavation by the power shovel. When an occurrence of ore or a zone of enrichment has been discovered, trenching and pitting of the prospect is done by power shovel. Three mechanical shovels are now used on this phase of the operation. They have contributed immensely in expediting surface examination.

When the overburden becomes too deep for shovel work (12 feet), light mobile drills (generally mounted on half-trucks) are used to test the ground. They penetrate to bed-rock where a sample is taken.

When a deposit has been outlined either by power shovel or by test drill, large drills which penetrate the ore to depth are then used to determine the tonnage present. Vertical holes are placed at regular intervals both along and across the orebody. Two types of drill are used: churn drill and diamond drill; both types of drill being used to chop through the ore. There is actually little core drilling. Sludge is recovered and a sample for analysis taken for each five-foot length of ore material.

In order to investigate the physical character of the ore and to determine the reliability of drill results, shallow shafts have been sunk and adits (tunnels) driven into a number of these deposits. In every case, the results were excellent. Drill results were found to be on the conservative side and the physical properties of the ore very satisfactory.

The Railroad

Contracts for the construction of the railroad have been let. Clearing of the right of



Seven Islands, Quebec, terminus of the railway. Arrow indicates location of ore docks and approximate route of proposed railway which is now under construction.

way has begun and equipment and supplies were shipped by boat daily from Montreal before the freeze-up. A temporary dock to handle heavy construction equipment has been built at Seven Islands.

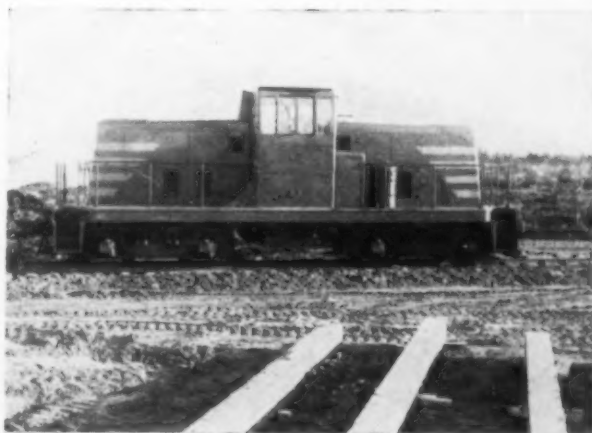
The railroad to be known as "Quebec North Shore and Labrador Railway", a subsidiary of Iron Ore Company of Canada, will run from Seven Islands to Knob Lake, Quebec, a distance of 358 miles. From mile 150.8 to mile 356, the railway will run through Newfoundland territory. The route follows the "grain" of the country, a particularly happy feature which will greatly facilitate construction. The rail distance is only about 12 per cent greater than the air distance.

The first 100 miles follows the course of the Moisie, Nipissis and Wacouna Rivers which flow south through deep and rugged canyon-like valleys. North of mile 94, the line enters a plateau and the grades are light. The summit of the railroad—2,056 feet—is reached at mile 150.8. The maximum grade on northbound empty trains is 1.8 per

cent. The maximum adverse grade on loaded southbound trains is .3 per cent.

One tunnel 2,250 feet long will be required at milage 11.5. Two major bridges will also be required: one 680 feet long across the Moisie River at milage 12, the other across the Hamilton River at milage 328. There will be receiving and ore-grading yards at Seven Islands. At Knob Lake, there will be a marshalling yard with spurs to the ore crushers and loading hoppers at the mines.

The railroad is to be operated with diesel locomotives. Four 1,600 horsepower units



First diesel locomotive at Seven Islands.

J.A.R.



Looking up the Moisie River at Milage 12.

W. E. ROSS

Temporary wharf for unloading construction equipment at Seven Islands.

W. E. ROSS





W. E. Ross

Contractor's headquarters on Moisie road at Milage 2.5, looking north towards Laurentian Hills.

The cleared right of way for the railway at Milage 2.

W. E. Ross



will be required to pull each ore train. The ore cars are of 112 net-ton capacity. Trains will consist of 100 cars capable of carrying 10,000 long tons of ore per trip.

Seven Islands is the southern terminating point of the railway. Locomotive and car repair shops and administrative offices are to be located there as well as the ore-loading dock. This is an ideal deep-water harbour, ice-free for at least nine months of the year. It could easily be kept open throughout the winter by using ice-breakers. Present plans call for the delivery of 60,000 to 70,000 long tons per day to Seven Islands during a five-to six-month season for annual shipments of 10,000,000 tons. Ships will be loaded at the rate of 6,000 to 8,000 tons per hour. A substantial stock-pile will be kept in reserve at Seven Islands, to supply the demand during the off-rail season.



Power Facilities

Hydro-electric power for operations at Seven Islands will be furnished by a development on the Ste. Marguerite River, some 20 miles west. For early stage operations at the mines, Ungava Power Company, a subsidiary of Iron Ore Co. of Canada, proposes to develop a joint railroad bridge and power site at the outlet of Menihék Lake at mile 328. The initial installations planned are two 5,000-horsepower units at each locality.

Ungava Power Company has an ample reserve for expansion as Eaton Canyon on the Kaniapiskau River, some 70 miles northwest of Burnt Creek camp, has been leased by the company. It has a potential of 500,000 horsepower. Grand Falls, on the Hamilton River, one of the largest undeveloped power sites in the world, lies 140 miles southeast of Burnt Creek. It has a potential of 1,250,000 horsepower.

Plans for Production

Ore shipments are scheduled to begin in 1955 with an initial production of 5,000,000 tons; this will be increased to 10,000,000 in 1956 and may eventually attain 20,000,000 tons.

During the period of railroad construction other phases of the development must proceed simultaneously. A town must be built in the vicinity of Knob Lake to house company personnel. The various deposits must be stripped and prepared for open-pit mining.

Iron Ore Company of Canada will build and equip the railway, erect and equip suitable ore-handling docks, equip and operate the mines, construct the required dwellings and other facilities and develop and supply electric power.

Financing

To date, expenditures on all phases of the operation have been approximately \$10,000,000. The minimum additional expenditures required to attain production will amount to between \$155,000,000 and \$160,000,000.

Grand Falls on the Hamilton River, Labrador.



Eaton Canyon on the Kaniapiskau River, Quebec.

As announced recently, the authorized capital structure of Iron Ore Company of Canada is: \$125,000,000 of first mortgage bonds, \$40,000,000 of income debentures, and \$60,000,000 of common stock. In addition to supplying the required funds, Iron Ore Company of Canada will pay Labrador and Hollinger North Shore companies a royalty of 7 per cent of the market price F.O.B. Seven Islands, but not less than 25 cents per ton.

Marketing

Blast furnaces of the American Steel companies that have shared the financing and guaranteed a market for the ore are located at centres such as Cleveland, Youngstown

and Pittsburg. As a result, most if not all of the output will be shipped to these points.

In order to ensure a financially successful operation, production must be undertaken on a scale of 10,000,000 tons per year. Steelmen fully realize that there is no market for such a tonnage in Canada and, for this reason, the ore must be exported. On balance, Canada is actually an exporter of iron ore. However, an ample tonnage of Quebec-Labrador ore is being reserved to provide for the growth of the steel industry in Canada.

The accompanying diagram depicts graphically alternative routes for shipping ore to the consuming centres. Although the direct route up the St. Lawrence River to the Great



The M. A. Hanna Company

Lakes is shown as a possibility, the facilities of the present canal system are such that only a small fraction of the total volume of ore to be moved could be handled in this way. The alternative routes are slow and more costly.

Construction of the St. Lawrence Seaway would greatly facilitate the movement of Quebec-Labrador ore to the midwest by providing cheaper and more rapid transportation. Moreover, the Seaway would furnish much-needed power for industry.

Another important consideration that has hitherto been stressed but little is the strategic angle. The only substantial source of iron ore on the North American continent other than the Lake Superior area is New Quebec and Labrador. It is a well known fact that the reserves of Mesabi Range are on the wane. In the event of war, it would be much easier to protect a shipping lane from Seven Islands to the Great Lakes than to depend upon vulnerable ocean routes thousands of miles long.

Mesabi won World Wars I and II, because of the easy availability of its direct-shipping, open-pit ore. This reserve can now be supplemented by making New Quebec and Labrador ores easily available through construction of the St. Lawrence Seaway. Imminent plans for production combined with the compelling demands of national defence put new force into the overwhelming mass of convincing evidence in favour of the construction of the Seaway.

Future of Iron Ore Production

At the contemplated rate of output, present reserves indicate a life of over forty years for the iron ore field, but afterwards what will happen? A noteworthy feature of discovery has been that almost all deposits have been found as surface outcrops. Their dimensions have been outlined by shovel work and drilling. In the space that intervenes between deposits, much of the surface is covered by overburden and beneath it lie extensive areas of iron formation which will require many years to test. The outlook for

additional tonnage is obviously hopeful and, without undue optimism, a long life for the iron ore field appears to be assured.

The development of Quebec-Labrador iron ore will have endless ramifications on the national economy. Not only will it add materially to the revenue of United States dollars, but it will mean a great variety of new jobs and new business ventures for our people and new markets for an endless list of products. Already the impact of capital expenditures is felt through the millions of dollars that are being spent for construction equipment and supplies. It means new business for the banks, the railroads, the aviation companies, the steamship lines and an interminable list of other commercial organizations. Eventually also new industries will doubtless be built up on iron ore, and the new railroad will open a new territory to mineral exploration. In brief, there is no part of our economy that will not be influenced in some way by the iron ore development — not only during the construction period, but for many years to come because of the sustained earning power of the iron ore.



J. A. Retty standing on high grade iron ore at Sawyer Lake. He was conducted to this deposit in 1937 by Mathieu André (below), now chief of the Montagnais Indians, Seven Islands, and still a prospector.

D. Ridout

Typical drillers.

Richard Harrington





Earthquake In Ecuador

United Nations photographs

Over fifty towns in the central provinces of Ecuador were wracked by death and destruction in August 1949 as one of the most disastrous earthquakes of our century pulverized stone cathedrals, adobe huts, schools, banks and hospitals, claiming between six and eight thousand lives. One hundred thousand homeless survivors, many of them injured, wandered about in a daze, unable to comprehend the cataclysm that had moved mountains, opened gaping holes in the face of the earth and filled the air with sulphuric gases. The vital irrigation system was destroyed and crops were ruined. Total losses reached an estimated \$100,000,000. Brave efforts were made by the people themselves to conquer the disaster, but the situation called for more relief than Ecuador alone could muster. In response to an appeal made by the United Nations Economic and Social Council, member nations rushed medical aid and emergency supplies, while short-term relief work was also undertaken by the various United Nations agencies, and technical experts were dispatched to assist the Government of Ecuador in its vast long-range reconstruction program, which is still being implemented.

Right:—Despite repeated tremors most of the inhabitants of Pelileo, Ecuador, refused evacuation. Clinging obstinately to their strips of land, they erected a shack-town on the ruins, using wooden boxes, eucalyptus branches, straw and bamboo mats to provide temporary shelters.

Right, centre:—The survivors showed remarkable courage and initiative, eagerly rebuilding amidst scenes of destruction. Here Manuel Cando of Izamba, who lost his wife and two children, is seen with a friend salvaging lumber from ruins to build a new house.

Right, below: The World Health Organization quickly came to Ecuador's aid, providing DDT to be sprayed on the refuse and rubble as protection against epidemics; it also assisted in mass vaccination to prevent typhus and sent experts who helped to reorganize the supply of drinking water.

Below:—Experts of the Food and Agriculture Organization guided efforts to restore irrigation, surveying the area and helping to co-ordinate the work of volunteers who laboured to preserve the fertility of their earthquake-ravaged soil. The F.A.O. also advised Ecuador's Government regarding the protection and storage of grain in stricken areas.





Left:—In response to United Nations appeals many countries sent aid to Ecuador. Mexico and Uruguay donated blankets, which are shown being distributed to young earthquake victims. Amongst other gifts, children's clothing was provided by Sweden, while Venezuela contributed to the blood bank and gave \$1,000,000. Canada, the United States, Colombia, Uruguay, Chile and Venezuela sent teams of doctors, medical students and nurses.



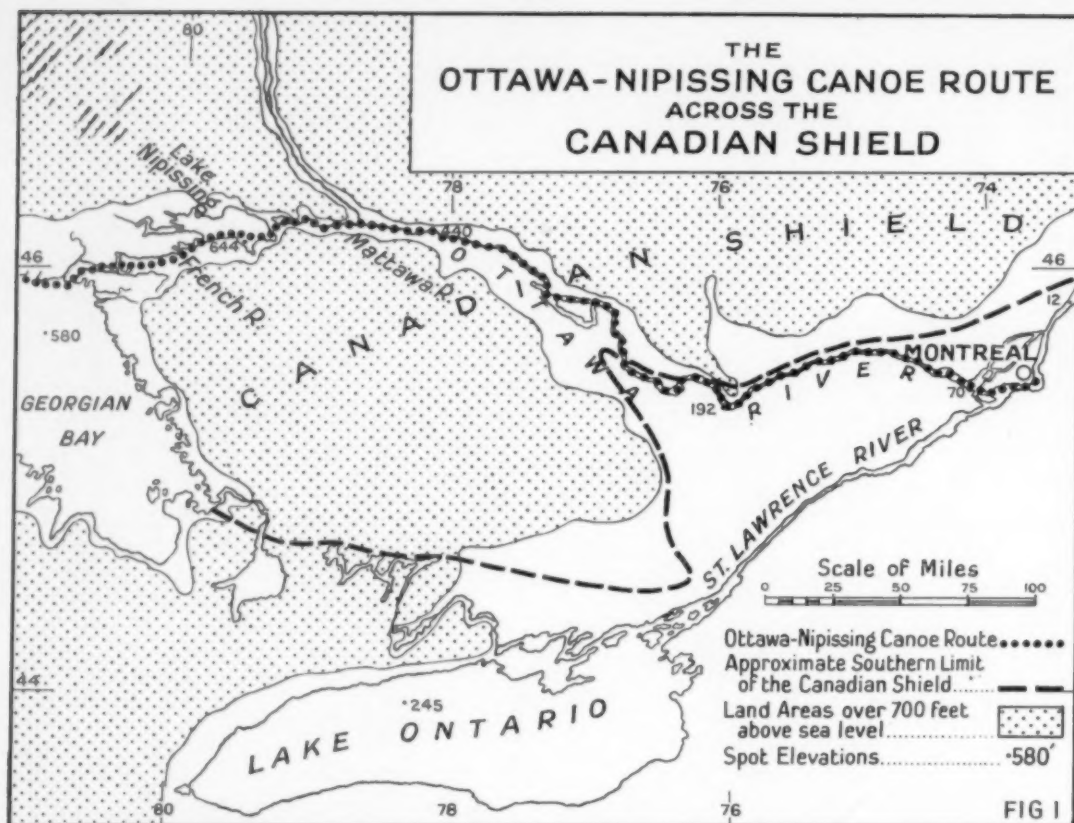


Above:—With three children to feed, Eva Sanchez de Chicaiza has no time to mourn her husband (a tinsmith) and her oldest boy, both lost in the earthquake. Her tiny improvised shack is transformed into a workshop; she will carry on.

Left:—The first concern of relief workers was, and still is, the children. Milk distribution was quickly organized by the United Nations International Children's Emergency Fund; this was not easy, as roads and railways had been destroyed, but Indians from the mountain region spared no effort to deliver U.N. supplies to youngsters in outlying villages and numerous volunteers could be seen carrying on their backs great casks, the milk from which was subsequently allotted to those authorized to receive it.

Right:—Supplies of lard, too, were made available for *tostados* (the staple food of Indians and peons of the Andes) so that mothers might continue to prepare toasted Inca corn in a *paila* (bronze cauldron) for their children, nearly 40,000 of whom are still receiving supplementary food rations in the stricken areas.





The Ottawa-Nipissing Canoe Route In Early Western Travel

by GEORGE R. RUMNEY

IN THE LITERATURE of early North American travel are found many references to the Ottawa-Nipissing canoe route between the St. Lawrence River and the Great Lakes. From the *Jesuit Relations* and the writings of Champlain, Joliet, Henry, Mackenzie and others, it is learned that the Ottawa and Mattawa Rivers, Lake Nipissing, and the French River formed the most important canoe route to the west during the seventeenth and eighteenth centuries. This ancient waterway occupies a shallow, irregular trough (Fig. 1) connecting the basin of Georgian Bay with the valley of the St. Lawrence River and forming a natural passage across the rocky masses of the Laurentian Upland westward from Montreal to Georgian Bay.

In 1615 Samuel de Champlain and the Recollet priest, Joseph Le Caron, journeyed

by canoe up the Ottawa River and across Lake Nipissing to Georgian Bay, thus opening a route to the west that was travelled for over two hundred years by fur-traders, explorers, and missionaries. Men who paddled their birch canoes along its waters established the first forts and trading posts on the shores of the Great Lakes, and explored for the first time the regions toward the north and west, and southward into the Mississippi Valley. In time, however, with the discovery of other routes and new modes of travel, the Ottawa-Nipissing route declined in importance and by 1825 was nearly deserted.

Although the essential facts about the Ottawa route to the lakes are well known, analyses of its importance in discovery and exploration are lacking. It is worth while, therefore, to consider the part played by

this historic highway in early western travel from the time of its discovery in 1615 until 1825.

For convenience the relation of the Ottawa-Nipissing canoe route to early exploration and discovery may be considered in two periods: the first of these, the French period, began with Champlain's journey in 1615 and ended with the fall of New France, in 1763; the second, marked by British control of the fur trade in Canada, began in 1763 and ended in 1825.

French occupation of the St. Lawrence Valley and the region of the Great Lakes began with the building of a fur station at Tadoussac in 1600, and within a few years Hurons, Nipissings, Ottawas and other Algonquin tribes who hunted near the shores of Georgian Bay and the Ottawa River began to paddle their canoes down the Ottawa to trade their furs at this and other posts along the St. Lawrence. By 1615 an expanding commerce in beaver, otter, marten and muskrat pelts had been established with Indians of the distant lakes and the upper reaches of the Ottawa.

Besides their primary interest in the fur trade, the French in the St. Lawrence Valley were by this time concerned with the discovery of a route to the western sea, the establishment of lasting settlements, and the founding of missions among the heathen tribes. The trade in furs, however, was the chief reason for the importance of the Ottawa-Nipissing canoe route in westward travels for more than two centuries.

The French were quick to discover that the birch-bark canoe, invention of the northern Indian, was well suited for travel on the lakes and rivers of the rocky, forested wilderness around them where these light craft could be carried from one lake to another and past the numerous waterfalls and rapids that frequently obstructed the flow of rivers. Moreover, the St. Lawrence and the Great Lakes lie in a region of North America where the paper birch, essential resource of the Indian canoe-maker, achieves its largest growth. In addition, spruce and fir trees, valued sources of wooden frames

and of pitch for caulking, are present everywhere in the surrounding forests.

Many adventurous Frenchmen, adapting themselves to the use of the canoe and the Indian's way of living in the wilderness, were soon roaming the forests far to the west in search of furs. They, like the Indians, discovered that the shortest and safest route to the west lay along the Ottawa River and across Lake Nipissing to Lake Huron.

The Ottawa-Nipissing route was shorter, although more difficult, than existing routes farther south—such as that leading up the St. Lawrence to Lake Ontario, and thence by the Trent River and Lake Simcoe to Georgian Bay. Moreover it was safer for two very good reasons. It passed northward of the Iroquois country bordering Lake Ontario and the headwaters of the St. Lawrence where war parties had for many years made it unsafe to travel. It was safer, as well, because its narrow lakes and rivers were protected by high forested banks from the strong winds which frequently made the open waters of Lake Ontario unnavigable for canoes.

Despite the saving of time and the protection it offered, the Ottawa-Nipissing route was not without hazard. The Ottawa River, with its tributary, the Mattawa, is a series of deep, narrow lakes connected by numerous waterfalls and rapids over which the clear waters tumble in a series of descending steps from an altitude of about 664 feet near Lake Nipissing to nearly sea level at Montreal. The shallow, capricious waters of Lake Nipissing are drained toward the southwest



Champlain on Georgian Bay.

(Courtesy C. W. Jefferys and Ryerson Press)

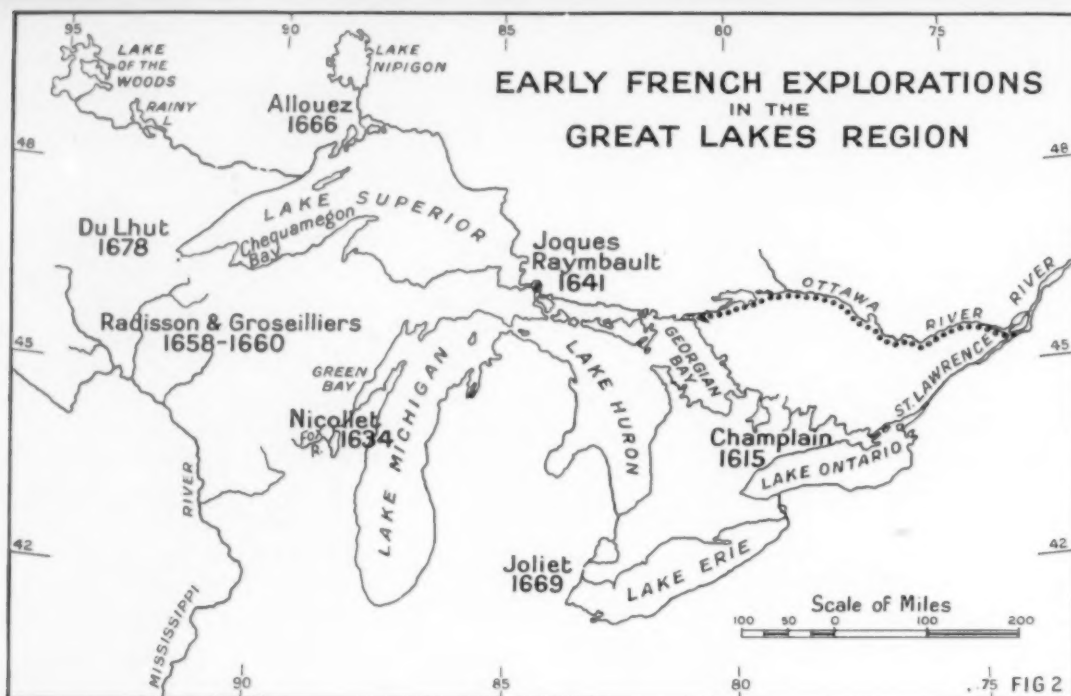


FIG 2

into Georgian Bay by the many channels of the French River whose unhurried flow is also broken by waterfalls and rapids. Hence the journey from Montreal to Lake Huron was interrupted many times by portages, where canoes and cargoes had to be carried or dragged past the foaming waters with

frequent danger to men and materiel.

From this main artery of travel along the Ottawa River and across Lake Nipissing, French fur-traders and missionaries extended a far-reaching network of water highways into the forested lands of the Great Lakes region and beyond.



FIG 3

The French never lost interest, however, in the possibility of employing a southern route to the west across Lake Ontario, and in 1669, while the Iroquois were temporarily at peace, the first voyage to Lake Huron by way of Lakes Ontario, Erie and St. Clair was undertaken by Galinée and De Casson. (i) From that time onward the lower lakes and the overland trails connecting them were travelled with increasing frequency.

Still the Ottawa-Nipissing route retained its pre-eminence as a water highway between the St. Lawrence and the Great Lakes, for travellers on the southern routes were not entirely safe from Iroquois attacks until 1701, when a final peace treaty with those war-like tribes was made. Even after peace was declared the established canoe route up the Ottawa was preferred by both trader and missionary, for the birch canoe, because of its light weight and cargo capacity, continued to be the most practicable means of travel into the distant fur-hunting regions of the west, while it was quite unsuited for long voyages on the open waters of the larger lakes.

In little more than a half-century of exploration, voyageurs and missionaries of New France, travelling by way of the Ottawa River and Lake Nipissing, discovered all of the Great Lakes and much of the adjoining area, including the headwaters of the Mississippi River, which later led them to the Gulf of Mexico.

The earliest account of travel on Georgian Bay, Lake Ontario, and the lands adjacent to them, is found in the record of Champlain's voyages in 1615. (ii) Later French explorations are recorded for the most part in that remarkable collection of geographical and historical material, the *Jesuit Relations*. From these detailed accounts we learn that Jean Nicollet, in 1634 (Fig. 2), was the first white man to reach Lake Michigan, Green Bay, and the Fox River country in Wisconsin. The Jesuit Fathers, Raymbault and Jogues, were the first to see the falls of St. Mary (Sault Ste. Marie) at the foot of Lake Superior in 1641. Radisson and Groseilliers, between 1658 and 1660, explored the upper



Mattawa River: view eastward (downstream) from the head of Des Roches Rapids, about nine miles west of the town of Mattawa.

reaches of the Mississippi River and much of the state of Wisconsin. Five years later, Father Allouez established a mission at the head of Chequamegon Bay, and during the following year discovered Lake Nipigon north of Lake Superior. The adventurous Joliet, returning to Montreal from Lake Superior in 1669, proceeded by way of Lakes St. Clair, Erie and Ontario, thus making the first recorded voyage over this portion of the

Mattawa River: view northward from the head of Des Roches Rapids, about fourteen miles west of Mattawa.



(i) Thwaites, Reuben Gold, *Travels and Explorations of the Jesuit Missionaries in New France*, Vol. 50, pp. 320-21, Cleveland, 1896.

(ii) Etienne Brulé, ascending the Ottawa River in 1610, is thought to have been the first white man to explore the Great Lakes region. Brulé left no written account of his travels, however, and Champlain's record therefore contains the earliest description of the Great Lakes. See Butterfield, C. W., *History of Brulé's Discoveries and Explorations*, Cleveland, 1898.

Great Lakes. (iii) In 1678 Sieur Du Lhut spent a year with the Sioux Indians at the west end of Lake Superior and gained a detailed knowledge of eastern Minnesota and northern Wisconsin.

Thus were the primary discoveries in the Great Lakes region made by men who travelled the Ottawa-Nipissing route to the west. From these beginnings French exploration was later extended, although by other routes and with other modes of travel, down the Mississippi River to the Gulf of Mexico, and westward to the Rocky Mountains.

Jesuit fathers, travelling the Ottawa route to Georgian Bay, founded missions at Sault Ste. Marie, St. Ignace and Green Bay in 1669 (Fig. 3); and these became the first enduring settlements on the shores of the Great Lakes. In 1701 La Motte du Cadillac set out from Montreal with a flotilla of twenty-five canoes, journeying up the Ottawa and across Lake Nipissing to Lake Huron, whence, by way of the St. Clair River and Lake St. Clair, he proceeded to the west bank of the Detroit River where he built a fur post (near the site of an abandoned fort) that later became the city of Detroit.

By 1775, when the war between France and England in the New World began, the Jesuits had established missions southward

on the Mississippi to Kaskaskia, and a chain of fur posts had been built by the French traders extending northwestward to Rainy Lake, Lake of the Woods, Lake Winnipeg, and the Saskatchewan River. With the fall of New France in 1763, however, nearly all the French forts and missions, established during more than a century and a half of exploration and discovery, were abandoned.

Although the British acquired all the former French territory in 1763, including the far-flung hunting regions of the northwest, Scottish and English merchants who came to Montreal after the conquest, were at first unwilling to risk their fortunes in trade with Indians who had lately been allies of the French. The centre of the Canadian fur trade remained, however, at Montreal, where it had been for more than a century, and by the 1770's British traders had begun to send canoe-loads of trade goods up the Ottawa and across Lake Nipissing to the western fur country.

The renewed fur trade rapidly expanded over the routes laid out by the French, and the sites of their forts and trading posts were occupied by the British. Most of the Indians soon forgot their hostility to the English-speaking traders and readily resumed the barter in furs.

The volume of canoe traffic from Mont-

(iii) Margry, Pierre, *Découvertes et établissements des Français de l'Amérique Septentrionale, 1614-1754*, Vol. I, pp. 143-161, Paris, 1879. It should be noted that Margry states, in the pages referred to, that Joliet preceded Galinée and De Casson (see previous page 1) in the exploration of Lake St. Clair and Lake Erie.



Entrance to Portage Trail (now overgrown), leading from Trout Lake, at the head of Mattawa River, to La Vase Creek, which empties into Lake Nipissing.

real, increasing rapidly, represented at first the interests of many independent merchants. As competition among them became keener, the costs of manning and outfitting the canoes for long voyages into the interior increased. Coupled with the higher costs of operation were the risks involved in the slow turnover of furs, and a growing competition with the well-organized agents of the Hudson's Bay Company who had for many years been encroaching on the territories of the Montreal traders from their base at York Factory on Hudson Bay. To avoid financial ruin a number of individual traders merged into partnerships, the most important of which was the North West Company, organized in 1784. This company competed successfully with the Hudson's Bay traders for nearly forty years, not only throughout the former regions of French exploitation, but beyond them as well, extending a fur-trade empire westward to the Pacific Coast.

While the financial headquarters of the North West Company was established at Montreal, the main fur depot was shifted to Grand Portage, and later to Fort William at the mouth of the Kaministiquia River. Despite these changes and an increasing use of supply vessels on the lakes, most of the furs were taken to Montreal in canoes by way of the French River, Lake Nipissing, and the Ottawa. Supply vessels, according to Voorhis (iv), transported heavy and bulky freight to Mackinac, Sault Ste. Marie and Fort William, while furs and trade goods were carried in canoes by the Ottawa-Nipissing route, which thus continued to serve as the chief link between Montreal and the fur regions that were being extended at this time far into Western Canada.

The rivalry that resulted between the Hudson's Bay Company and the Northwesters soon led to an intensified search for new hunting-grounds, as the number of beaver and other fur animals in the forests between the Great Lakes and Hudson Bay became seriously depleted. During this period, fur-traders from Montreal explored northwestern Canada to the Arctic Ocean, travelled for the first time over much of the

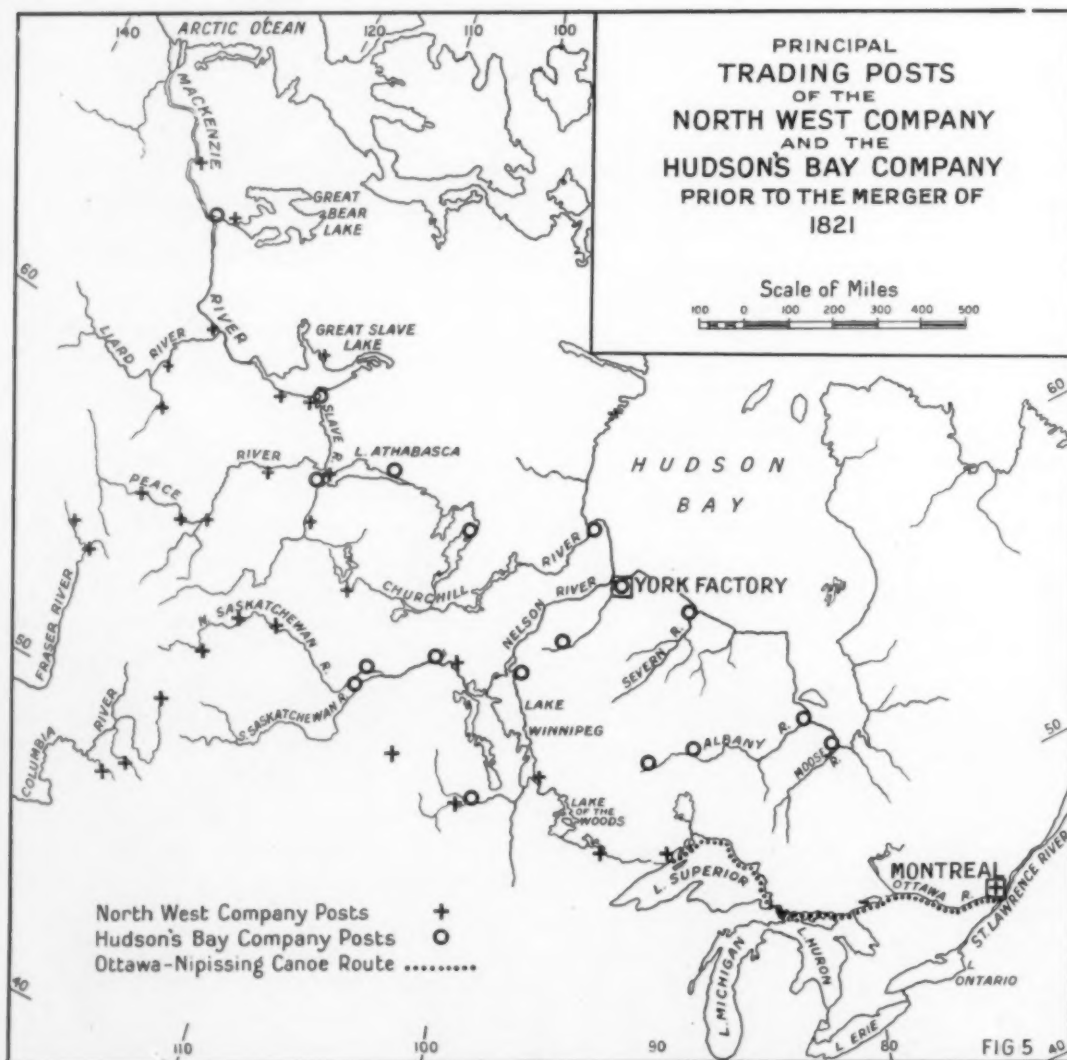
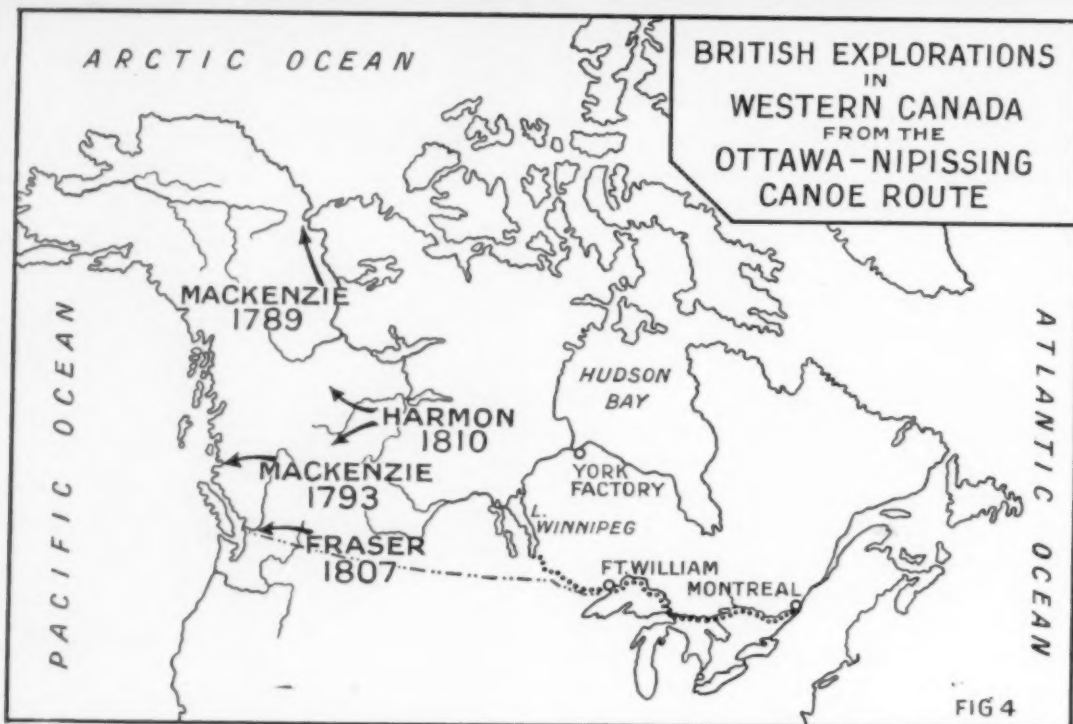


Northward view across Lake Talon; in the foreground is the end of one of the portage trails along the Mattawa between Lake Talon and Robichaud Lake.

Canadian Rockies, and made the first overland journey to the Pacific Ocean. Famous explorers, such as Mackenzie, Harmon, and Fraser (Fig. 4), employed by the North West Company, began their historic travels at Montreal, whence they set out for the Great Lakes in one of the numerous North West Company canoes that travelled the Ottawa-Nipissing route to the west.

The North West Company's business became less profitable, however, as the fur-hunter pursued his prey farther toward the west, lengthening the distance between the outermost trading posts and headquarters at Montreal. Increasing costs of personnel and equipment necessary to gather a

(iv) Voorhis, Ernest, *Historical Ports and Trading Posts of the French Régime and of the English Fur Trading Companies*, p. 21, Ottawa, 1930.



Indian paintings (coloured red) in the main channel of the French River, about six miles west of Lake Nipissing. Dr. E. F. Greenman, University of Michigan archaeologist, has determined these to be of pre-historic origin, but is uncertain as to what the symbols represent.



sufficient harvest of furs from distant posts on Lake Winnipeg, the Saskatchewan River, Lake Athabaska and across the Canadian Rockies so reduced the profits of the North West Company that it was forced to unite with the Hudson's Bay Company in 1821 (Fig. 5).

After the union of the two companies Montreal's importance as a fur-trade centre declined rapidly, for most of the furs from Western Canada were then sent to the posts on the shores of Hudson Bay. York boats carrying furs down the Churchill, Nelson, Severn, Albany and Moose Rivers to Hudson Bay had replaced the birch canoes of the North West Company as the principal

means of inland travel in the fur trade. Except for the occasional passage of a canoe serving those posts on the upper Ottawa and the Great Lakes that were kept in operation by the Hudson's Bay Company, the lakes and rivers of the historic route were all but deserted by the fur-traders, and by 1825 Montreal had completely lost its pre-eminence in the fur trade to York Factory, bringing to an end, after more than 200 years, the importance of the Ottawa-Nipissing canoe route.

View westward overlooking Les Dalles Rapids in the French River, four miles upstream from Georgian Bay.

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London Travels

by RENÉ LECLER

ON THE MORNING of May 24, 1862, a little group of solemn, top-hatted gentlemen, which included one of Queen Victoria's ministers, stood at the corner of Bishop's Road, near London's Paddington Station, ready for a strange experiment. Having covered themselves with white overalls, they climbed down a flight of stone steps and came to a platform beside a railroad track. In the semi-darkness, just below ground level, a locomotive, big-funnelled and panting, stood in front of half a dozen box-like cars. Holding onto their hats, the gentlemen climbed aboard and sat gingerly on wooden benches; then, with a deafening noise, the train plunged into darkness.

So London's "new-fangled" Metropolitan Railway (the brain-child of a City solicitor named Charles Pearson) began its trial run to the Farringdon Street terminus near the

City's boundary. Eight months later, on January 10, 1863, the line was opened for traffic.

The idea of using tunnels for city transportation was not a new one. Sir Marc Isambard Brunel, son of Isambard Brunel of steamship fame, had constructed the first tunnel under the Thames and opened it to pedestrians in 1843. A South African engineer, James Henry Greathead, invented a large, circular tunnelling shield, which resulted in easier boring; and Peter William Barlow advocated, in 1867, an iron lining for tunnels and drilling by a cylindrical shield, which led to stronger tunnels.

Other underground lines quickly followed Charles Pearson's venture. In December 1890 the first of the present "tube" railways (and the first *electric* tube railway in the world) was opened. This was the City and South London Subway, three-and-a-half

Above:—Deep down under London's busy streets runs the most complicated and efficient underground railway system in the world. Warren Street Station is characteristic of many in the central area; framed by London Transport posters, the booking hall may be seen just inside the entrance—while outside (extreme left) stands the ubiquitous flower barrow.

miles long, from the City to Stockwell, south of the Thames.

In 1900 the six-mile "twopenny tube" from Shepherd's Bush to the Bank (of England) was opened. The uniform-fare system, however, proved uneconomical and was changed when the line (Central London Railway) was extended at each end.

The District and Metropolitan Railways remain sub-surface lines, while the Central, Northern, Piccadilly and Bakerloo Railways are tubes, rising to the surface on the outer fringes of London. Today the Northern Line boasts the longest continuous tunnel in the world: seventeen-and-a-quarter miles from Morden to East Finchley (via Bank).

Progress on other forms of transport also continued apace. The last of the old horse buses (which had started the change-over to motors at the beginning of the century) was withdrawn at the outbreak of World War I; and in the late 'twenties and early 'thirties their upper decks and stairways were enclosed.

In the 'twenties many different companies owned London's tubes, buses and trams. The two main bus companies, the London General Omnibus Company and Thomas Tillings, gave Londoners good service; but competition among some of the lesser companies was fierce and the public consequently suffered much discomfort. Many "pirate" buses appeared in the London streets, weaving in and out of the main routes, picking up passengers anywhere and everywhere and set-

ting them down wherever they chose. Sometimes there were fights between the employees of competitors.

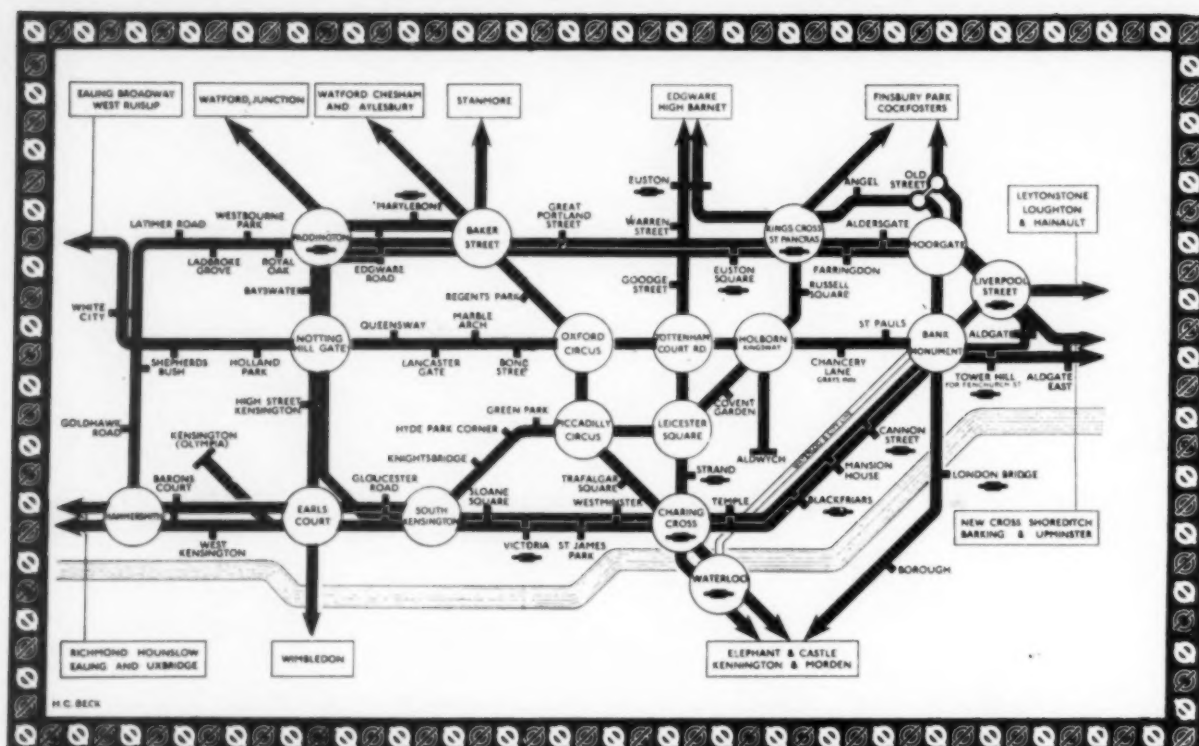
In 1933 an Act was passed by Parliament which created a single administrative unit, the London Passenger Transport Board, with a capital of £110,000,000. The L.P.T.B. was not a government body but a public authority whose chiefs were appointed by a board of trustees representing the London County Council and other authorities. Today London Transport is as much a part of London's life as are the Hyde Park orators, shopping in Oxford Street and cricket matches at the Oval. Though they may occasionally grumble, most Londoners realize that it gives them the best integrated transportation service in the world.

London Transport employs 100,000 people: car-men and bus-drivers, mechanics and engineers, poster-designers and cleaners. Every day its trains, buses and trams carry nearly 13,000,000 Londoners to work and play, link the hills of Hertfordshire with those of Kent, and crisscross the 2,000 square miles of the Metropolis and its surroundings. Its underground trains use seven tunnels under the Thames and serve 281 different stations along 248 miles of tracks.

But London Transport comprises much more than cold facts and statistics; it lives and breathes. Its atmosphere is part of London's own, throbbing with crowds and noises that never end. Even its smell is its own, specially in the tubes.

Interior of one of the underground train carriages. The seats are comfortably padded and within sight of each, amongst the row of advertisements above the windows, are charts showing route, stations and interchanges. There is ample standing room, and at every stop the doors slide open and close automatically, being controlled by a guard at the rear of the train.





This diagram shows underground railway lines and stations in London's central area only. (The chart including the whole system is much larger with the numerous tentacles of suburban routes reaching out for miles in every direction.) On the original diagram the various lines (Bakerloo, Central, Circle, District, Metropolitan, Northern and Piccadilly) are all printed in different colours. Circles indicate interchange stations; 'rolling-pin' symbols—British Railway stations.

On January 1, 1948, all of London Transport's services were nationalized and L.P.T.B. became London Transport Executive, one of the executives of the British Transport Commission. The tubes are, of course, the backbone of the system. Their lines, crossing here and curving there, span the map of London like a gigantic spider's web. The trains (six, seven or eight carriages in length, and propelled by motors totalling between 1,500 and 2,000 h.p. per train) streak into the white-tiled stations. The double sliding doors, electro-pneumatically operated by the guard, open with a sigh. People press in. Then comes the little interlude when the platform staff, women in grey smocks and cloth caps or men in dark blue, come into their own. They are the sheepdogs of the travelling flock. Their voices are much the same from one end of London to another; their diction is like that of any railroad employee anywhere in the world. The syllables come tumbling out in one even flow: "Mind-

the doors", or "move along there please". Soon the doors slide together and the train shoots onwards.

All underground carriages follow one colour pattern: they are red outside (for red is London Transport's own colour) and green or blue and white inside. The very latest post-war carriages are more spacious than the older models and boast strip-lighting. The seats, upholstered in red, brown, grey or green patterned moquettes, face each other lengthwise for part of the carriage and crosswise for the rest. On the average carriages seat forty people, but as many again can stand. At the passengers' eye-level on the curve of the ceiling a strip of small advertisements alternates with cleverly designed diagrams showing the stations and interchanges on the line.

In 1933, when London Transport took over the various undertakings, there was not much uniformity between them. It was at this point that the late Frank Pick, a Lin-

colnshire man who became the Board's Vice-Chairman, stepped in and began to streamline the stations. He was a man of taste and imagination, a creative planner who quickly saw the need for brightness and gaiety in the transportation system. He departed from the accepted policy of making all stations alike and whenever a new one had to be built studied local requirements, the site available and the kind of people who would use it. The result was good architecture and pleasing variety.

Many inner-London tube stations have their booking-halls underground. Piccadilly, the most central of all and the best known to tourists, is circular, with seven different entrances from street level. The escalators start from the centre. With its brightly-lit tobacco, fruit, confectionery and book stalls, and showcases displaying the wares of large West End stores, Piccadilly Station was a favourite meeting place for the soldier on furlough. He used to stand about, looking at the ticket machines and trying to plan his route, following the many charts and signs. The station also has numerous telephone booths and chocolate machines—which latter, in austerity Britain, have yielded nothing since early in the war; only the temptation remains!

A good cross-section of London's population uses Piccadilly Station at different times of the day. First to arrive are the workers. Then come the suburban housewives, out

for a day's shopping in the West End. In the evening the homeward rush is one mad scramble. Later at night the booking-hall has a different atmosphere altogether. It is then the realm of theatre-goers (there are about fifty theatres and cinemas within a half-mile radius), lonely people looking for kindred souls, lovers arm-in-arm, foreign tourists, seamen of all nations.

Most modern stations in the outer suburbs can claim two features in common: they are built of brick and have a tall brick tower. It was Vice-Chairman Pick's idea to make the station a landmark for the neighbourhood, something which would beckon the undecided passer-by. He also designed the London Transport sign (a thick red circle with a bar across) which now appears on everything connected with London Transport—stations, guide-maps, trains, uniforms of personnel, etc.

Many stations, like those of the older sub-surface lines, the District and Metropolitan, were not touched by Pick's magic wand. Some remain almost as they were in Victorian days, poorly planned, draughty and often with wooden platforms. After seventy or eighty years' existence they provide a striking contrast with the modern stations.

Visitors to London are always attracted by the escalators which, in addition to numerous elevators, carry passengers effortlessly between platform and surface. There are 174 escalators in service in 55 stations. The long-

Every day about 1,750,000 passengers enter 281 stations to travel on London's underground railway. In order to handle these crowds with a minimum of delay, escalators are replacing elevators at all the larger stations; most escalators can carry 10,000 passengers an hour.



The underground 'Concourse' at Gants Hill Station on the Central Line is considered an architectural triumph. This lofty hall, 40 feet below ground (it is illuminated by strip lighting) is 140 feet long, 20 feet high and 50 feet wide between the edges of the station platforms.



ENJOY YOUR LONDON

No. 1. The Museums

ENTERTAINMENT comes before study in the London museums. The idea that museums are only for the student is out of date. Ask the children if they think Stephenson's Rocket in the Science Museum is dull. See if they ever tire of making the models work. And are you really unmoved by Scott's final pencilled words kept now and for all time in the manuscript room of the British Museum? The designers who go to the fashion display in the Victoria and Albert, notebook in hand, go for the most practical reason. And, let's be quite frank, if you go for the first time because the museums are warm and free and something to do on a rainy afternoon, they will be just as glad to see you as if you had come to study a Saxon ship-burial or to verify a reference in Domesday Book.

<p>BRITISH MUSEUM Natural History Egyptian Greek and Roman Medieval and Modern Manuscripts Printed Books Coins and Medals Minerals and Geology Zoology Botany Library</p>	<p>VICTORIA AND ALBERT MUSEUM Architecture Furniture Jewellery Lace Leatherwork Metalwork Paintings Sculpture Textiles Toys and Games Arms and Armour Clocks and Watches Maps and Plans Prints and Drawings Stained Glass Tapestry Ceramics Glass Woodwork Ironwork Stone Ivory Bone Shell Horn Wax Paper Bookbinding Printing Photography Cinema Music Theatre Fashion Design Architecture Furniture Jewellery Lace Leatherwork Metalwork Paintings Sculpture Textiles Toys and Games Arms and Armour Clocks and Watches Maps and Plans Prints and Drawings Stained Glass Tapestry Ceramics Glass Woodwork Ironwork Stone Ivory Bone Shell Horn Wax Paper Bookbinding Printing Photography Cinema Music Theatre Fashion Design</p>	<p>SCIENCE MUSEUM General Science Earth and Planets Life Physics and Chemistry Technology Transport Space Medicine Agriculture Industry Commerce Education Recreation Health Environment Conservation Planning Transport Space Medicine Agriculture Industry Commerce Education Recreation Health Environment Conservation Planning</p>
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London Transport Ticket Office will give you a booklet showing in greater detail what the museums contain, when they are open and how to get to them.



Gay coloured posters, many of them by well known artists, play an important role in banishing the drabness of underground stations and cheering the many thousands of passengers served daily by London Transport. It was Frank Pick who first conceived the idea of enlisting the co-operation of artists and designers to make his public relations system aesthetically as well as economically effective — and the public has proved genuinely, and increasingly, appreciative ever since. Some of the posters are entirely illustrative, with the intent of attracting travellers to beauty spots and places of special interest (Hampton Court, the Zoo and Whipsnade, St. Paul's, etc.) in and around London. Others, like Anthony Gilbert's contribution to the "Enjoy Your London" series shown above, are also informative — in this case inviting readers to London's various museums, listing a number of them, and giving instructions regarding the most convenient means of transport to each.



HAMPTON COURT

BY BUS 14 · 27 · 73 · 150 · 152 · 201 · 214 · 216

BY UNDERGROUND

to Wimbledon thence trolleybus 604

or to Hammersmith thence trolleybus 667



KEW GARDENS STATION



OPEN DAILY, ADMISSION 1^d
TUESDAYS & FRIDAYS (STUDENTS DAYS) 6^d

KEW GARDENS





Typical of many of London's main streets are these scenes outside Selfridges, Oxford Street (above), Mansion House, Cheapside (below, left) and the National Gallery, Trafalgar Square (below, right). Everywhere one sees quantities of great, red, double-decker buses, heading for scores of different destinations and manoeuvring with astonishing dexterity through heavy traffic on narrow streets. Omnipresent, too, are the box-like and frequently antiquated taxis (above), each detail of which, including the melancholy 'honk' of their horns, is strictly regulated.



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est, at Leicester Square, rises about 80 feet at speeds as high as 180 feet per minute on the upgrade. Most escalators can carry 10,000 passengers an hour.

Every day of the year London Transport employees collect roughly thirty tons of coins from the travelling public. In the underground system the ordinary pay boxes have long proved inadequate to deal with the flow of passengers. Today 85 per cent of all railway tickets are issued by 1,130 automatic ticket machines, which are an integral part of the smooth organization of London Transport. The newest of them seems little short of a miracle; it prints, cuts and issues the tickets and gives change all in two seconds.

Much of the atmosphere of London Transport is created by its posters. It was Frank Pick who first put the human touch in London Transport's public relations system. He was fond of the arts and was appalled by the meanness and drabness of contemporary posters. He commissioned artists, designers and writers to brighten them up, some of whom were well known, while others were given their first chance by the enthusiastic Mr. Pick. He organized competitions and often lectured on the role of art in industry.

Perhaps the most famous example of the human touch in this direction was the career

of "Billy Brown of London Town". The creation of David Langdon, the popular cartoonist, Billy Brown was the impersonation of the typical Londoner. He was not an athlete nor a film hero: just an ordinary little chap with a black coat, a bowler hat and a rolled umbrella. When he first appeared in 1941 in trains, stations and buses, he *always* carried his gas mask. He was the soul of meekness, polite, practical—and very much a stuffed shirt! His exhortations, laid down in rather feeble rhymes, wrenched a smile from the saddest face, even while Jerry was on the warpath upstairs.

When he appeared on buses he was the perfect passenger:

Billy Brown has had a rise
In busmen's estimation
Since he paid the exact fare
And named his destination.

It was weak but effective. Billy became a living part of the Londoner's wartime lore.

The war greatly tested the ingenuity of London Transport. From the start it was in the thick of it. Its buses carried thousands of children to evacuation areas in the country. Hundreds of buses and trams and many trains were total casualties, and services were necessarily depleted; but the provinces came to the aid of the capital with a magnificent

Since World War II many new trolley-buses have been put into service on London routes. They are six inches wider than the old models, giving increased comfort to passengers and permitting conductors to move up and down the aisles, while collecting fares, with greater ease. These vehicles, which are electrically operated (their trolleys running along overhead wires) move so silently that they are extremely popular in residential areas.





A regular service of 'water buses' (operated by R. G. Odell, Ltd. has been inaugurated on the Thames. Photographed while undergoing trials on the upper reaches of the river in March 1949, the Prefect is an eighty-foot, diesel-engined craft that can carry 212 passengers and a crew of four.

spirit. Buses arrived from as far away as the Scottish Highlands to replace, temporarily, those which London had lost; and it gave one a comfortable feeling of solidarity to travel from the West End to the blitzed City in buses marked "Manchester Corporation".

But, above all, the vast underground system proved a boon to Londoners during the air raids. It became, more than ever before, a part of the people's lives. Every night, month after month, men, women and children, with bundles of blankets thrown over their shoulders, streamed towards the tube stations. At one time, during the height of the blitz, London Transport provided bunks for 180,000 Londoners on the platforms and in the corridors. But many more came down each night and slept on the floor itself.

A kind of community spirit soon developed and people began to organize themselves for the long hours to be spent underground. In each station there was a first-aid post, a warden and volunteers serving tea and snacks from hastily organized canteens. While small children slept, oblivious to all, a few feet from the trains which roared past till midnight, the grown-ups took part in sing-songs or listened to radios. To travel late at night in those days was an unforgettable experience; to see those thousands putting up with incredible discomfort and hear them wondering what their little streets would look like in the cold light of dawn was to feel the heartbeats of a nation.

Works of art and important archives were stacked ceiling-high in some disused tunnels; others, newly built but not yet in use, were transformed overnight into brightly lit offices where vital government departments carried on. One, five miles long, contained a complete factory producing aircraft components.

Today London's underground is engaged in a large program of post-war improvements. Stations are being modernized and services extended. It is to the credit of the engineers and planners that, in spite of great shortages, twelve brand new stations have recently been opened along the east and west extensions of the Central Line, while seventeen others have been taken over from steam operation and renovated.

In central London the trains run with amazing frequency. At one station, Charing Cross (which serves the Northern, Bakerloo—derived from "Baker Street to Waterloo", the extent of the original line—and District Lines), over 200 trains on six tracks stop in a peak hour. On the District Line alone forty trains per hour run in each direction—a record which points to the efficiency of safety devices.

London's red, double-decker buses provide an altogether different kind of transportation. Underground trains are impersonal; they differ little from one another. Buses are whimsical and their drivers very human; all acquire personality from the conductor

whose little machine punches tickets with the clink of a bell. He may be gloomy, gay or flippant; he may tread on your toes, or help you with your parcels; and, if he is in a jocular mood, you may be sure that his humour will be London's own brand. During the latter part of the war most conductors were women; popularly known as "clippies", they did their job, involving long hours of standing or running up and down stairs, with great gusto and courage.

London Transport operates 9,500 buses, coaches, trolleybuses and trams (or street-cars), each of which covers an average of nearly 45,000 miles per year. There are altogether 500 routes, many of them linking the suburbs without touching the West End. The longest is coach route number 716—sixty-six miles from Hitchin to Chertsey.

The buses are a godsend to the tourist who wants to "do" London and cannot afford a private car. He sits on the top deck and for a few pence has a chance to view every landmark worth seeing. Some routes, like the 13, 77, 11 and 9, go through a great deal of historical London.

Trolleybuses, too, are found in many parts of London. Not unlike buses, but more spacious, they swish along the wide roads like silent monsters. One can hardly hear them; they start smoothly, without warning noises, and their acceleration is more rapid than that of underground trains. These electrically operated buses were first introduced in 1931 for use in residential districts where their silent progress would not disturb sleepers.

South and southeast London, on the other hand, is the domain of the trams. These are older, noisier and less comfortable than the bus and trolleybus, and a menace to road traffic. Most Londoners dislike them, and London Transport is now engaged in replacing all trams with oil-engined buses—a scheme which will take three years to complete. The trams also go below ground sometimes. From Holborn a tunnel takes them under Kingsway to the Thames Embankment; then they cross the Thames and continue out into streets and streets of little

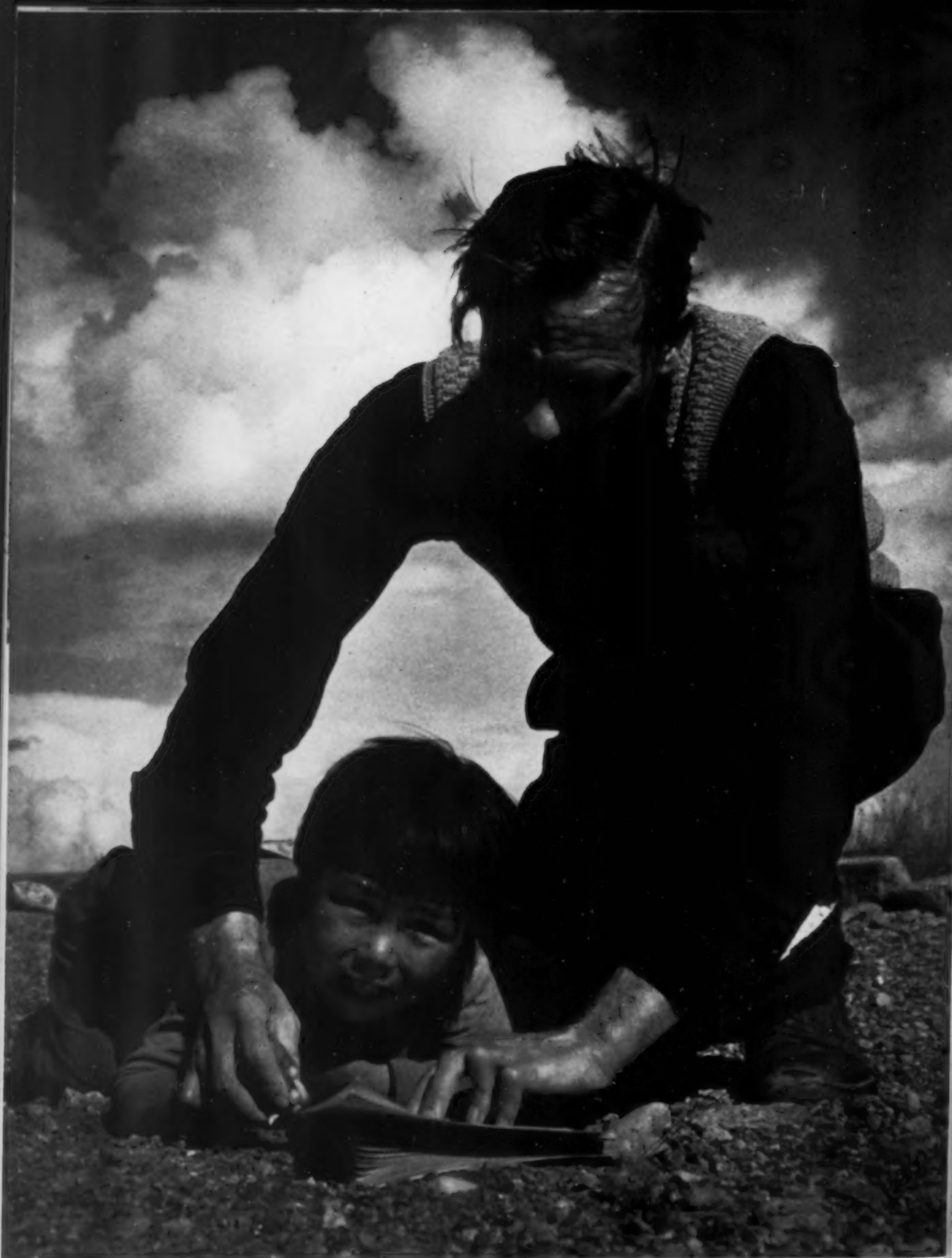
houses that seem to stretch to the world's end—through Catford, Balham, Streatham, Crystal Palace—and the vast expanse of London south of the river.

London Transport also helps Londoners to give way to more bucolic moods. Its Green Line Coach system of express routes into the capital's own countryside is a boon in the spring and summer. The single-decker green coaches, spacious and generously upholstered, radiate from the West End or the City or cross London altogether. In an hour one can go to Amersham in Buckinghamshire for lunch at its fifteenth-century inn, or pay a visit to royal Windsor, or explore some leafy Kentish vale. The Green Line is London's escape route, and since the war and during the shortage, or occasional complete lack, of gasoline Londoners have made full use of it.

As Frank Pick once said: "The metropolitan city is the creature of transport and the measure of London's growth is the measure of the progress which has been made in transport". London Transport, with its enormous organization, has recreated the unity of the capital which the industrial revolution and the Victorian building orgy had destroyed.



Double-decker trams crossing London's Westminster Bridge, with Big Ben and the Houses of Parliament in the background.



A young Eskimo pupil receives a writing lesson on the open beach. The teacher is the Reverend W. R. James of the Anglican mission at Baker Lake, Northwest Territories.

Education Goes North

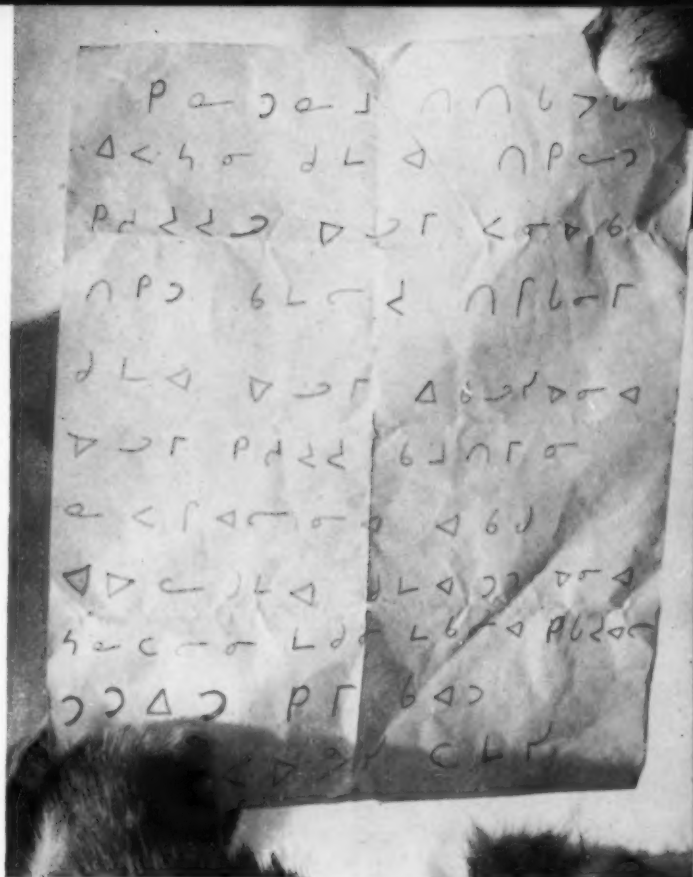
by E. N. GRANTHAM

Photographs by S. J. Bailey, Department of Resources and Development, unless otherwise credited.

AQUIRING an education in the Canadian North is a bit like trying to swim the English Channel—it's a long way to the other side. And it is this ever-present problem of distance that presents a major difficulty for those who bear the responsibility of ensuring that the education of Canada's northern children is not neglected. Teaching the three R's in the Northwest Territories presents many a problem unique in the teaching field. The solutions found for them have had to be just as original.

The education of white, Indian, Eskimo, and half-breed children is carried on at territorial and Indian day schools maintained by the Government, and at residential and mission day schools operated by the Church of England, the Roman Catholic Church, and the Northern Canada Evangelical Mission. The Government assists these schools by annual operational grants, by grants for the maintenance of native children and the children of destitute white and half-breed parents, and by furnishing school supplies and equipment. Like all aspects of administration in the Territories, education comes under the direction of the Northwest Territories Council of the Department of Resources and Development.

The only school in the Northwest Territories maintained chiefly by local taxation and administered by a local school board is the modern nine-classroom elementary and high school at Yellowknife. It also receives an annual grant from the Canadian Government. This school serves all the children of Yellowknife and is available to the more advanced children who live at other settlements in the Territories. Educational standing obtained in the Yellowknife High School



Most Eskimos in the Eastern Arctic can read and write syllabic script. The news-letter above was written by Mrs. Voisey, wife of the Hudson's Bay Company manager at Padlei.

Richard Harrington





Yellowknife has a modern nine-classroom school which serves not only all the local children but the more advanced pupils from other settlements in the Northwest Territories.

N.F.B.

compares favourably with that in high schools in Alberta and is accepted by universities throughout Canada. The schools of the Mackenzie District (the western portion of the Northwest Territories) are inspected periodically by a superintendent of education appointed by the Federal Government, who has his headquarters at Yellowknife.

Territorial day schools are located at Port Brabant, Aklavik, Fort Simpson, Fort Resolution, Coppermine, Port Radium, Fort Smith in Mackenzie District; Cape Dorset and Lake Harbour on Baffin Island, and Coral Harbour on Southampton Island. Indian day schools have been established at Fort Norman, Fort McPherson, Arctic Red River, Fort Franklin, Fort Ray, Rocher River, Hay River, and Fort Good Hope.

The Church of England operates a residential and a day school at Aklavik and the Roman Catholic Church has residential schools at Aklavik, Fort Providence, and Fort Resolution.

Day schools are also operated by the Federal Government at Fort Chimo and Port Harrison in the Province of Quebec. These schools are in Eskimo territory along the arctic coast of Quebec, in which region the Federal Government is responsible for the administration of Eskimo affairs.

Among the many special problems created by conditions in the far north, is that of educating Eskimo children. In the Eastern Arctic, they receive some education at mission day schools but their naturally nomadic way of life makes the periods when they

Beyond the windows of this classroom lies the Arctic Ocean. Plants growing inside include a calla lily. The Eskimo children have illustrated text books, crayons and scissors. Miss D. L. Robinson, the welfare teacher at Tuktoyaktuk (Port Brabant) north of the 69th parallel, tries to impart to her pupils a standard of values they can carry into their adult life.



A territorial day school is maintained by the Government at Fort Smith in the Mackenzie District. In this district the curriculum of the Alberta Department of Education is followed.



are available for instruction comparatively short. Eskimos have a great affection for their children and when an Eskimo family moves in search of fish or game, it usually moves as a body. This is fun for the children but hard on school attendance.

The Eskimos of the Eastern Arctic have long had a system of syllabic writing (geometric phonetic characters) which most of them can now read and write well. Syllabics have been successfully used to provide educational material in the Eskimo language, to give advice on health, hygiene, and native economics for both children and adults. Prepared by the Arctic Division of the Department of Resources and Development, *The Book of Wisdom for Eskimos*, written both in Eskimo and English, and in syllabics and Roman Script, has become a popular and widely used manual in the north. The illustrated text is simple and graphic in language, and provides practical advice that ranges all the way from the proper method of mixing powdered milk to how to clean a gun. Revised editions of *The Book of Wisdom* have enlarged its scope and kept the information contained in it up-to-date.

The past three years have brought some valuable innovations into the field of northern education. Among these is the provision of educational sound films routed to the settlements on a regular circuit, and the

inclusion of northern classrooms in the C.B.C. school broadcast series. New school buildings have been constructed, existing buildings enlarged, and a new class of teacher, the Welfare Teacher, introduced into the system.

Welfare Teachers, as their name implies, do more than teach. One of their most important duties is to provide community leadership and so help to make the settlements in which they work happier, healthier and better-organized places. The Welfare Teacher has become the centre around which much of the life of the northern community revolves. Capable and, above all, adaptable, the Welfare Teacher has introduced a new element into an educational system whose special problems call for just this combina-



An Indian boy goes to school. There are eight Indian day schools in northern Canada.

N.F.B.



In summer these Baker Lake Eskimo children on the way to school are dressed like boys in the more southerly parts of the country.

tion of good teacher and understanding friend.

The schools in the Mackenzie District follow the program of studies for the elementary and secondary schools as authorized by the Alberta Department of Education. A modified elementary school curriculum, suitable for the unique needs of schools in the Arctic

Right:—In winter, school-wear consists of a caribou suit, fur inside. When it is very cold another suit goes on top, with fur outside.



regions, is now under consideration. In the remote areas, elementary and high school students have access to correspondence course studies issued by the Alberta provincial educational authorities.

In Yukon Territory the public schools at Dawson and Whitehorse have high school departments providing education leading to university entrance. University entrance (junior matriculation) examinations are held in June at Whitehorse and at Dawson by



authority of the British Columbia Department of Education. The examination papers are forwarded from Victoria and are returned there to be graded. In outlying districts, correspondence courses are provided at a nominal cost by the British Columbia Department of Education.

Those who accept the challenge of going down north to teach find they must make hay while the sun shines. Last winter a Welfare Teacher in Eskimo country found herself with only a small class all season. Then



Eskimo children learn early how to handle dogs. These boys attach traces to their sled outside the Roman Catholic mission at Chesterfield Inlet. The snowy mound at left is an igloo home.

in June, as holidays drew near, more children arrived from the camps and, finally, when it was time to close, these Eskimo girls and boys decided they wanted the school to stay open. During the winter they had been at a different kind of school, out with their families learning how to hunt the walrus, to fish, trap foxes, make skin garments, build igloos,

all the special skills an Eskimo must have to survive the arctic winter. Now, in summer, when life was less busy they wanted to learn to read and write. So the teacher kept school going all summer, accepting the reversal of schedule as just another incident in the adventure of carrying the three R's north of the 60th Parallel.

These boys at Bathurst Inlet are playing tag in a blizzard that grounded the plane carrying the visiting party. The wind is so strong it acts as a major obstacle in the tag game.





Small Animal Sculpture

by MARION G. ROGERS

The wood sculptor, John L. Bradford, in his garden.

MENTION wood carving and the usual mental picture will be of the floral or conventional designs used for furniture, the finely cut small figures of people or the less minute work of some animal carvings. Sculpture in most cases would call to mind the smoother lines of work done in stone or modelled in clay. Nova Scotia has produced an expert woodcarver whose work in the main portrays small animals, sometimes human heads. Where edges occur all are softly rounded producing an effect that has won wide acclaim as "sculpture in wood".

John L. Bradford of Hunt's Point started to teach himself woodcarving some twelve years ago and evolved his particular style, the graceful flowing lines strongly suggesting life and movement.

Heralded as a "new school" in the art of woodcarving, his style has been widely copied through the circulation of a brochure *Small Animal Sculpturing* written for MacDonald College during the early 1940's. This booklet deals in detail with the equipment needed, the suggested wood and how to handle it, care and sharpening of the knife blades and the details of how to finish numerous woods.

Founder-President of the Atlantic Woodcarvers Guild, which position he still holds, John Bradford was the first President of the Nova Scotia Craftsmens Guild, occupying the post for the three years allowed in its constitution.

A business man who has a considerable amount of travelling to do, Mr. Bradford

began his work with wood as a hobby. "It's such a handy one," he said, "for you can carry all you need around with you in your pocket—a jack-knife and a block of wood. You will be surprised what you can make from even a small piece." His smallest article was a tiny elephant a quarter of an inch long.

Many of the little figures are of birds, animals, reptiles or fish, carved from memory or from his imagination. When he starts work on a piece of wood he says that often he has little or no idea what it may become. The knots and whorls, the graining, the variations of density and colour and even the weather markings all tend to produce what he calls wooden thought pictures.

One tropical fish on his shelves was the result of a crooked knot that was at an angle in the wood. "For some time I just couldn't see how it could be used; it's pretty foolish looking I know, but there it is." He was grinning as he turned it around.

These tropical fish, from two to four inches high and long, are thin through but are



The mushroom groups are each carved from a single block of wood.

carved with such exact balance that they stand upright. This particular one was about four inches and in outline much like the tropical angel fish, but it had the saddest expression, the corner of its open mouth carved with a decided droop. When he turned it around the mouth had an up-swing, laughing, like "the one that got away". "The expressions are emphasized by that difficult knot," he explained and described how the shape of the mouth had to be so carved to balance where the knot, which was the eye, showed at a different height on each side.

What woods did he use or favour in his work? During the years more than thirty varieties have been tried. Bits from far distant places have been sent to him, among them teakwood and ebony from Africa, coconut palm from the Andaman Islands, green-heart and wallaba from British Guiana, and the Tennessee red cedar which has definite colour contrasts in single pieces of the natural wood.

Native woods, pine, spruce, hemlock, poplar, fir and the beautifully streaked wood of the purple lilac were at the start, and still are, largely used, but some of his finest work, he claims, has been produced in the bark of the Alberta cottonwood tree and the bark of the Nova Scotia locust tree.

For some years Mr. Bradford has been numbering each piece made and over a period of about ten years had reached No. 1,541. He has carved in his own style a nine-foot totem pole of modern design for his garden.

A talented painter in watercolour and oils, John Bradford claims that much of the



A Bradford sea horse, about four inches tall. The natural finish emphasizes the use made of the wood grain in the design. Hyndman

beauty of his work in wood depends on the finish he uses. While varnish, oil or water-colour stains are used on colourless woods, the natural beauty of red cedar, butternut, mahogany, walnut, gum, apple and choice pieces of basswood and whitewood are given a natural finish.

The actual process of finishing includes the use of shellac, a very fine sandpaper, a mixture of shellac and alcohol, repeated applications of boiled linseed oil and pumice powder rubbed well into the wood and the excess powder wiped off with a clean cloth when dry. Following this the piece is given a good polishing with a flannelette cloth. The rubbing with oil and pumice and the polishing are repeated many times.

Bradford pieces have been exhibited not only in Nova Scotia (where they have figured at government exhibitions and with the N.S. Society of Artists, Maritime Art Association, Acadia Fine Arts Club) but in New York, Vancouver and the Canadian National Exhibition. Termed wood sculpture as distinguished from chip carving, whittling or relief, an entry in the Royal Canadian Academy's Annual Exhibition in 1947 was accepted as a piece of "sculpture in wood".

Height of the dragonfly and mushroom piece is about four inches.



EDITOR'S NOTE-BOOK

It was with great regret that the Directors of the Society, in December, accepted the resignation of Mr. Charles G. Cowan as President. Mr. Cowan was one of the group who worked to organize The Canadian Geographical Society in 1929. He became one of the original Directors and a Vice-President. In 1944 he assumed the Presidency. Throughout its existence he has devoted time and care to the affairs of the Society and has won the affectionate regard of Directors, Fellows, and Members. On retirement from active business life Mr. Cowan is leaving Ottawa and we wish him full enjoyment of his new-found leisure.

We now introduce to our Members the new President, Air Marshal Robert Leckie, C.B., D.S.O. Born and educated in Glasgow, Scotland, Air Marshal Leckie came to Canada at the age of sixteen. He joined the services in World War I and has had a distinguished career with the R.C.A.F. and R.A.F., retiring in 1947. Air Marshal Leckie has been stationed in many parts of the world and, in addition to his service duties, he has found time to write articles for magazines and service journals. We extend to him a warm welcome as President of the Society.

* * *

J. A. Retty, now a resident of Montreal, was born at Fort Coulonge, Quebec. A graduate of the University of Ottawa and Princeton University, Dr. Retty's career has been in geology—for a number of seasons with

Under the auspices
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**THE CANADIAN
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and
**THE ROYAL ASTRONOMICAL
SOCIETY OF CANADA**
a lecture, illustrated by moving
pictures, will be given on
The Great Ungava Crater
by
Dr. V. B. Meen
at 8:30 p.m. on Tuesday, January 9,
1951, at The National Research
Council, Sussex Street, Ottawa.

the Geological Survey of Canada, as lecturer and professor, and, since 1936, as chief geologist for the Labrador Mining and Exploration Company Limited, with intervals as geologist for the Quebec Department of Mines. Dr. Retty did all the pioneer work on the Labrador iron ore deposits, and it was he who first discovered and mapped the ilmenite area north of Havre St-Pierre where the big titanium development is now under

ANNUAL MEETING

The Canadian Geographical Society

The Society will hold its twenty-second Annual General Meeting in the Lecture Hall, National Museum of Canada, Ottawa, on Friday, February 23rd, 1951, at 8.30 p.m. The speaker at the meeting will be Dr. J. T. Wilson, O.B.E., Professor of Geophysics at the University of Toronto, whose illustrated address will be about his recent travels in New Guinea.

way. He is the author of numerous geological publications and maps.

* * *

G. R. Rumney began to specialize in the field of geography while studying at the University of Michigan. His graduate studies were interrupted by service in the United States Naval Service during the war, much of which time was spent in the Caribbean and Pacific Ocean areas. Upon receiving his Ph.D. at the University of Michigan after the war, Dr. Rumney became assistant professor of geography at Florida State University. In 1948 he was invited to set up a program in geography at the University of Connecticut, where he is now assistant professor in the department of geology and geography. Dr. Rumney became interested in Ontario at an early age through frequent visits to relatives in Canada. He has supplemented his geographical studies of Northern Ontario and Quebec with three summer field seasons in those areas, his particular interest being in settlement on the Canadian Shield.

* * *

René Lecler is a French journalist who settled in London in 1940. He is on the staff of a national weekly and has contributed articles to numerous British periodicals; he is also the author of a short handbook on the Arab countries. Mr. Lecler's particular interests are in travel and foreign affairs.

* * *

E. N. Grantham is an officer of the Northern Administration and Lands Branch of the Department of Resources and Development. He has for a number of years been closely associated with the work of education in the north.

* * *

Marion Rogers, after some years in newspaper work, is now a free-lance journalist and Ottawa representative of a national magazine. Her home is Ottawa but she recently went to Moose Factory to help at an Indian school.



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AMONGST THE NEW BOOKS

We Fell in Love with Quebec

by Sidney W. Dean and

Marguerite Mooers Marshall

(Ryerson, Toronto, 1950, 272 pp., \$4.25)

"A book of cities, shrines, villages, rivers, mountains and people", the husband-and-wife authors sub-title their rhapsody on French-Canada. It is an enthusiastic and personal account of their wanderings and repeated visits to the Province of Quebec. The book is for the armchair traveller, and stimulating background for the tourist. Not a guide-book in any sense, one can still learn a great deal from it, for the authors have sought untrodden ways.

These mature writers have covered hundreds of subjects in their writing careers, but probably none with more enthusiasm than this. For Quebec has been unalloyed pleasure to them, whether travelling in their 30-foot cabin cruiser, by car or steamship. They have seen the Quebec of the guidebooks, but infinitely more. Theirs "is not a yachting story, nor a fishing story; it is a love story. To fall in love with Quebec is easy".

I think it is easier for Americans than for Anglo-Canadians. The former seek "the beauty of strangeness, adventuring in another country . . . whose way of life is not ours". They do not have the built-in antagonisms, the deep-rooted conflicts, the agonized effort to understand, nor the family privilege of candid criticism.

The Deans know more of Quebec than most tourists. They have known and loved Montreal, Quebec and the familiar Gaspé. But their travels have shown them the

tranquil interior of the Eastern Townships, the rugged North Shore with its tumbling salmon streams, quaint Ile aux Coudres, and the remote Magdalen Islands. The occasional exuberant statement is inaccurate—one cannot see Bird Rock from Grindstone Island, for instance. But this is finicking.

The authors have enjoyed a remarkable reception throughout the province, as indeed they would have anywhere, for "we did not dissemble our love for land and people". With their enthusiasm and humility, they drew affection as effortlessly and relentlessly as a magnet draws steel filings. The love affair was not one-sided.

"In Quebec we found all that we sought and more. In her cities the tone of time, with overtones of history and medievalism. In her sweet valleys a nostalgic lost paradise. In her forests and on the shores of her far-off seas, a last frontier. Always, everywhere, waters, shores, rivers of thrilling scenic grandeur. Everywhere, always, a fine people, but half-known and less than half-understood, with rare qualities of courtesy, generous helpfulness, simplicity and pride."

This is no irritating attempt to "interpret" the French-Canadian to his fellow-countrymen. But many an Anglo-Canadian will realize that he has been too quick to take offence, too hasty in criticizing things merely because they are not his own pattern. If the Anglo-Canadian can visit Quebec with that sense of adventure, of going into a different country, and without political and racial overtones to mar his appreciation, it is almost inevitable that he, too, will fall in love with Quebec.

LYN HARRINGTON

*To our
European readers*

Early in 1951 the first four of a series of lectures on

CANADIAN GEOGRAPHY

will be given on Saturdays at 10.30 a.m. in the Cinema at The Imperial Institute, South Kensington, London, S.W.7

Jan. 27 ONTARIO

by J. S. P. Armstrong, Agent-General for Ontario

Feb. 3 SASKATCHEWAN

by Graham Spry, M.A., Agent-General for Saskatchewan

Feb. 10 SOME CANADIAN MAMMALS

by Harper Cory, F.C.G.S.

Feb. 17 BRITISH COLUMBIA

(Speaker to be announced later)

ADMISSION BY TICKET

Applications for tickets (free) should be made to W. H. Corkill, European Representative, The Canadian Geographical Society, The Mead, West Dumpton Lane, Ramsgate, at least 14 days prior to each lecture.

THE CANADIAN GEOGRAPHICAL SOCIETY

OTTAWA

CANADA

Canada, a Short History*by Gerald S. Graham*

(Hutchinson, London, 1950, 7/6)

Here is another book of Canadian history, one which gives the entire picture from Champlain to the accession of Newfoundland. It is an informed survey, very acceptable to those who wish a quick glance at the subject. Because of its brevity, it adds little to the knowledge of the student of Canadian history. The author has also had to forego the anecdotes and intimate word pictures which lure the casual readers.

Since the book is one of Hutchinson's University Library dealing with British Empire history, it must conform in style and format. It is an interpretation, rather than a textbook.

"It is an attempt to approach Canadian history from outside rather than from within North America; to give as much weight to European as to continental or indigenous influences", the author states.

After a spate of Canadian histories related by Canadians, Americans and Frenchmen, Mr. Graham's point of view is refreshing. In contrast to the former, with their natural inclination to place the emphasis within the country, or at least within the North American continent, this author views Canadian development from the British standpoint.

He knows his subject unquestionably. He spent some years as professor of history at Queen's University, Kingston, and is now Rhodes professor of Imperial history at the University of London. His previous books, *British Policy and Canada*, *Sea Power and British North America*, *Empire of the North Atlantic* testify to a thorough grasp of his subject.

LYN HARRINGTON

"Industry In Action In La Province De Québec"
(Provincial Publicity Bureau, Quebec, P.Q.)

This is a survey publication, and one which no one can examine without being impressed by the strength of Quebec's economy and by the forward-looking vigour of "industry in action" in that province. It should help effectively to remove any valid reason for lack of knowl-

edge (in other parts of Canada) about how the people and the government of Quebec are going about the business of making their province one of the most dynamic factors in Canada's economic expansion.

Designed primarily for businessmen, this publication has a legitimate and strong claim upon attention in industrial and financial circles not only in Canada but in many other countries. It deals with a vast domain in which industrial development is on the march on a very wide front. The arrangement of the contents under nine major sections relating to such topics as "Industry and Labour", "Water Power", "Pulp and Paper", "Primary Textiles", "Mining" and others, makes it easy for the reader to pick up quickly the material most pertinent to his own interests.

This booklet merits equally wide interest in the educational field. The picture it presents is one of international as well as national significance, because it relates to what is unquestionably one of the vitally important sectors of current North American development. Certainly, no Canadian can gain an adequate grasp of his own country unless it includes an up-to-date appreciation of modern industrial Quebec such as this publication unfolds.

Technically the booklet reaches a standard seldom approached in "official" publications. Colour printing is used with excellent effect. Combined with the well-printed text and photographs there is both a liberal and a skilful use of very well-designed maps and diagrams.

O. M.

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